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Development of A Web-based Feedback System for Academic Staff Assessment

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Abstract:- **Web-based feedback systems for the purpose of evaluating and assessing academic staffs by students in higher education has been in existence in most developed and some developing countries. This has been proven to be effective as it tends to enhance academic staff performance, from the feedbacks and comments students give online. However, in developing countries like Nigeria, such feedback systems have neither been deployed nor effectively functional. Hence, in this study we develop a web-based feedback system for academic staff assessment that can be adopted by tertiary institutions. The web-based feedback system is developed using the waterfall model approach. This approach is suitable due to the possibility of following a sequential process. Also, the various modules of the online feedback system were designed using Hypertext Markup Language (HTML) for the frontend; NoSQL for the database; and PHP for processing data between the frontend and backend. The designed web-based feedback system will be effective to enhance academic staff performance within higher institutions.**

1.0 INTRODUCTION

The 21st century era has wholesomely welcomed the geometric progression in the Information Technology (IT) dynamism (Sanni, 2013). This is so evident in all part of human endeavors such as economic, government, communication, and education (Jorgenson & Vu, 2016). This has resulted to the automation of different human activities, thereby leading to the presently occurrence of the global village. However, global village would not have been achieved without the virtue of education-enhanced IT deployment that depends on successful communication (Klimova, 2014).

Since, communication are not always successful, it is thereby measured when the communication completes its cycle at the feedback from the receiver (Warshauer, 1988). In the education sector, feedback from students is very important, and remains the major measuring scale to evaluate the success or failure of the tutors and lecturers.

In this computer age, the feedback from the students does not need to wait till the end of the semester before it is executed. This is against the backdrop of paper-based approach that characterized the present operation. Therefore, the real-time proposed feedback system would then be able to cater for various feedback need in the institution of learning.

Thus, the feedback could be seasonal, semester, mid-semester, weekly, end of each lecture, or during lecture delivery. These entire feedbacks amount to strategic planning and decision by the administration, while also trying to get the best from tutors. Figure 1 depicts how strategic and important the feedback is, in communication loop.

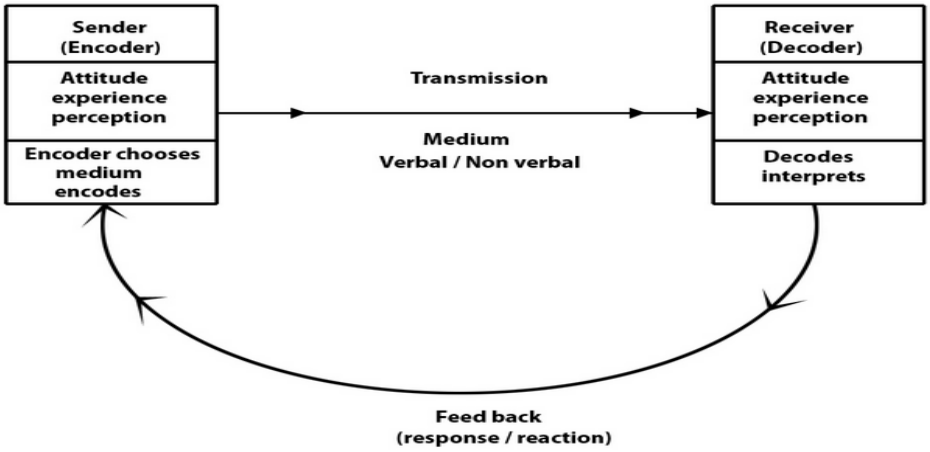

Figure 1. Communication process (Dance, 1967)

Aside the education sector, various feedback systems have been earlier developed and evaluated to better improve all parastatals, such as public presentation (Nguyen, Chen, & Rauterberg, 2012), and financial transactions in terms of business-to-business (B2B), business-to-consumer (B2C) (Tong, Wang, Tan & Teo, 2013).

While reviewing various forms of feedback system in the literature, it is observed that manual feedback system is both inefficient and ineffective (Jedhe, 2017). This has been as a result of digital trend in the Internet of Things (IoT) to not only guarantee

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accuracy but also cost-effectiveness, time-saving, convenience, accessibility, reach and scalability, flexibility, and anonymity (Patel, Agrawal, Gangani, & Vishwakarma, 2018).

In terms of report, which is highly germane in all forms of communication, IT has resulted into the need of ubiquity to deliver real time communication. This need calls for change from the traditional form of human-intensive deployment to machine-intensive process

2.0 RELATED WORKS

Abu Kassim and Buniyamin (2015) evaluated teaching quality of the tertiary universities across Malaysia using the generated data from student online feedback system (SUFO). The study was so necessary when the decline of experience cum adequately qualified Science, Technology, Engineering and Mathematics (STEM) lecturers was increasingly experienced in the educational sector of the country. In the study, based on the students' assessment using the SUFO, the lecturers' professionalism and teaching methods were evaluated. Similarly, the preliminary investigation results could compare the teaching quality between experience and inexperience lecturers. However, the final results of the students' feedbacks depicted the teaching quality of experience and inexperience lecturers inconclusive. This was found as a result of imbalance rating on each category by the students.

Also in a study carried out by Nirmal (2016) to evaluate online feedback system at the tail of each session through a process called 'Student Experience Survey'. The author collected serial students' feedback data which were used to compare students' satisfaction of each course in the school of Engineering and Technology (SET) at Central Queensland University (CQU). The result obtained showed that the online feedback system from the students actively promote innovation in learning and teaching process; thereby, increasing students retention and experience, school performance, but reduce attrition.

Another study carried out by Shrivastava, Kesarwani, Kadam, Chhibber, and Jayakumar (2017), the authors developed an online feedback system through which the students could feed any department or educational institute in Bharti Vidyapeeth Deemed University, Pune, India, back about the course structure, topics in the course, assigned faculties of the course, among others. However, this analysis system offered only the authentic user (Admin) to see the collective opinions of the students. The students' feedback was presented in form of pie-chart and graphs on the basis of objective questions, while Sentiment Analysis algorithm was used for the students' collective batch opinions. The result showed that the proposed system was better than existing system in terms of time-saving and cost-effectiveness.

Sivasankari, Srimthi, Ramya, and Fathima (2016) adopted semantic web (SW) technology to deploy online feedback system for educational institutions. The use of SW is to generate useful feedback reports. It equally adds a layer for advanced automatic processing, which further enables the generated data to be distributed and processed by both the human beings and software. The system provided feedback for each subject in each semester using an online web application. Interestingly, this proposed system was found to save time, and also offered easier management process.

All the related works highlighted clearly depicted that the authors in different categories have made worthy contributions to the study ranging from development to evaluation of the online feedback systems, as well as deployment of SW technology to generate real-time reports. However, none of these studies is found to consider both the academic staff and the institution infrastructures. This study is now to fill the gap by developing an online feedback system through which the students of the institutions could give a subtle feedback of both the academic staff and the institution infrastructures to the administration through a web based feedback system. Importantly, the academic staff could, as well, assess any student's academic performance and attitudinal dispositions, and, thereafter, make the report available to the school administration. This is so important because both the academic staff and the institution infrastructures remain the measuring scale for the educational success of the institutions of learning (Abubakar, Hilman, & Kaliappen, 2018).

3.0 METHODOLOGY

Waterfall model is applied for the implementation of the proposed system. This model is best suitable for this system because it is possible to gather all requirements before the commencement of the project and it follows a sequential process downward (Saxena, 2019). A schedule can be set with deadlines for each stage of development and a product can proceed through the development process model phases one by one.

3.1 System Design

This is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements (Strickland, 2007). It also involves the translation of all information into technical specification that accurately describes the design of the system, and serves as input into the system. This was achieved with the help of the students and lecturers of the department of Information and Communication science, University of Ilorin, Nigeria, and the academic planning unit staff. However, the success of this phase depends on the proper actualization of the system analysis. Figure 2 shows the sequential steps nature of the waterfall model.

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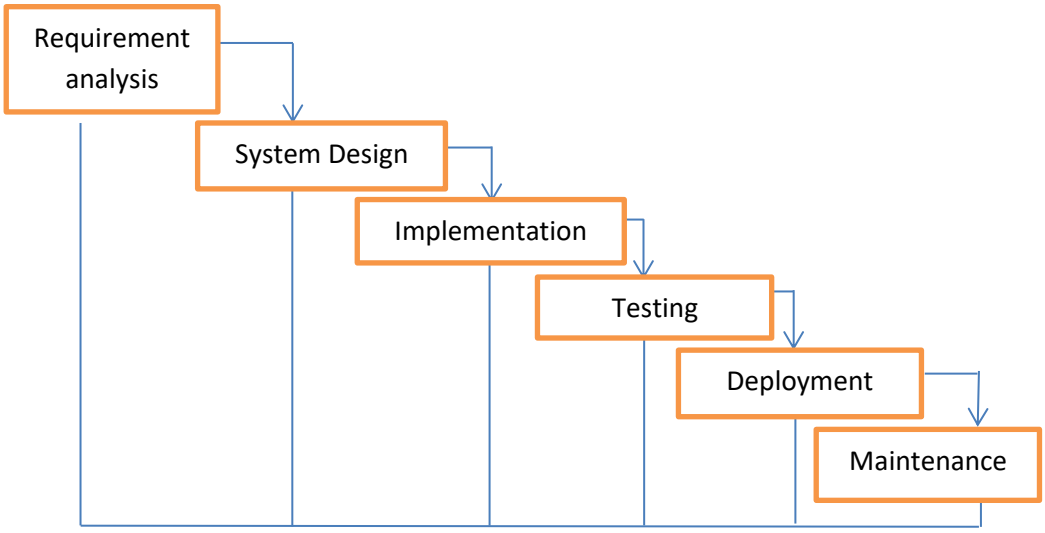

Figure 2: Sequential phases of Waterfall Model

3.1.1 Existing System

In an existing system, all processes are done manually, and its time consuming feature makes it unreliable in real-life scenarios. Questionnaires are only provided by the Director of Academic Planning unit (DAP), which are distributed to each faculty via a written memo. Each faculty officer then hands it over to the Head of each department, which afterwards gets across to each level class representative through the level advisers. The class representatives finish the task by distributing it to each student for assessment. On the completion of students' assessment, each student submits to his/her class representative, which then transverses backwards until accumulated at the DAP as feedback for executive action.

The questionnaires are analyzed on a 5-likert scale, while the average pass mark for each lecturer is 2.0. Interestingly, any lecturer with highest overall grade is rewarded (in kind). However, if a lecturer's pass mark is at 2.0, such lecturer would be advised to adjust where s/he is assessed low. Also, any lecturer found graded below 2.0, such lecturer might need to face a disciplinary committee where questions would be asked on what have resulted to such poor performance. In this existing system, the scores are calculated using Microsoft excel.

3.1.2 Proposed System

In addition to have a stress-free system against the existing system, it is indispensable to deploy a web based application. In the proposed system, the questionnaires are online, and students are required to log in, fill, and make submission at their pleasure time, but within the stipulated period. The proposed system also has additional features of giving feedbacks of both the department and infrastructures, which are the aiding tools for teaching and learning. Besides, the proposed system also offers the students assessment by the lecturers. This will assist the academic planning unit to measure students' co-operation with their lecturers and their readiness to learn. Inclusively, in the new system, each lecturer would clearly be aware of his/her assessment rank, which is not achievable in existing systems.

3.2 System Implementation

This section discusses how this system is implemented to facilitate the web-based feedback system in the selected higher institution. This system is hoped to be adopted, in the nearest future, by the other higher institutions of learning that are still being challenged with the manual operation.

Interestingly, to ease the task in making the system user-centred design which is devoid of complexity, the implementation is executed using modularization approach. Therefore, we have the following modules: Students module, Lecturers module, DAP module, and Admin module.

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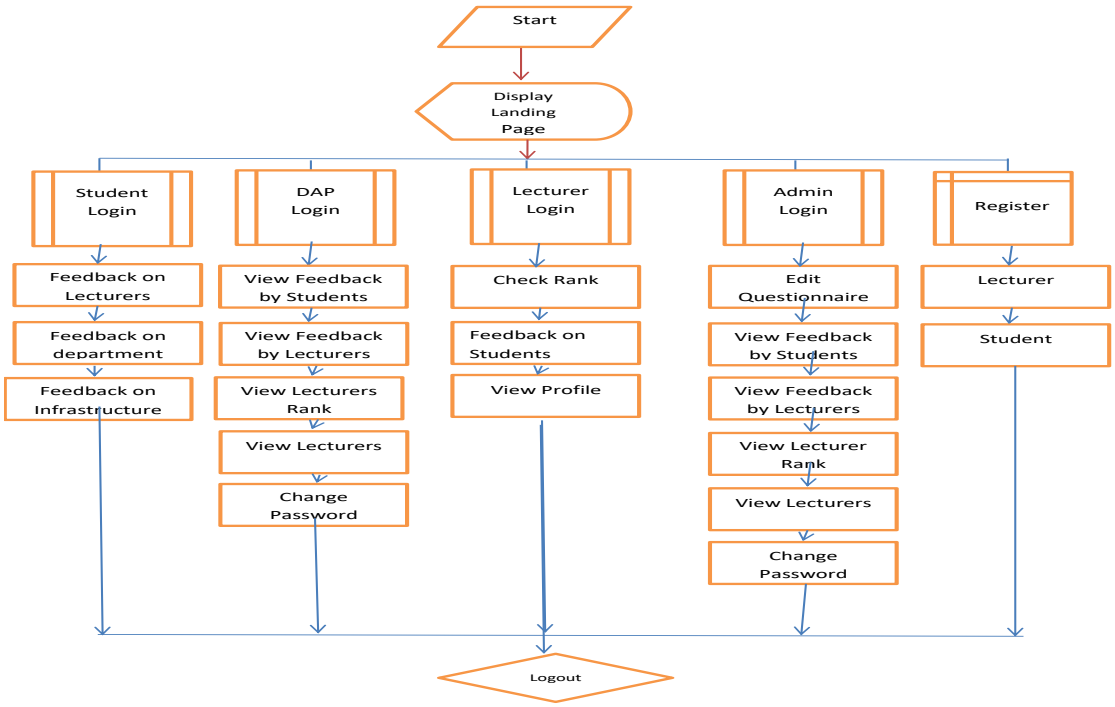

Figure 3. Proposed Online Feedback System

3.3 Modules

3.3.1 Students Module

The student module gives access to students to register, login, give feedback on lecturers, give feedback on the departmental services and the infrastructure, and also view their lecturers' profile. Figures 4 and 5 show the student's login page and registration page respectively.

Figure 4: Home page/ Students' login page

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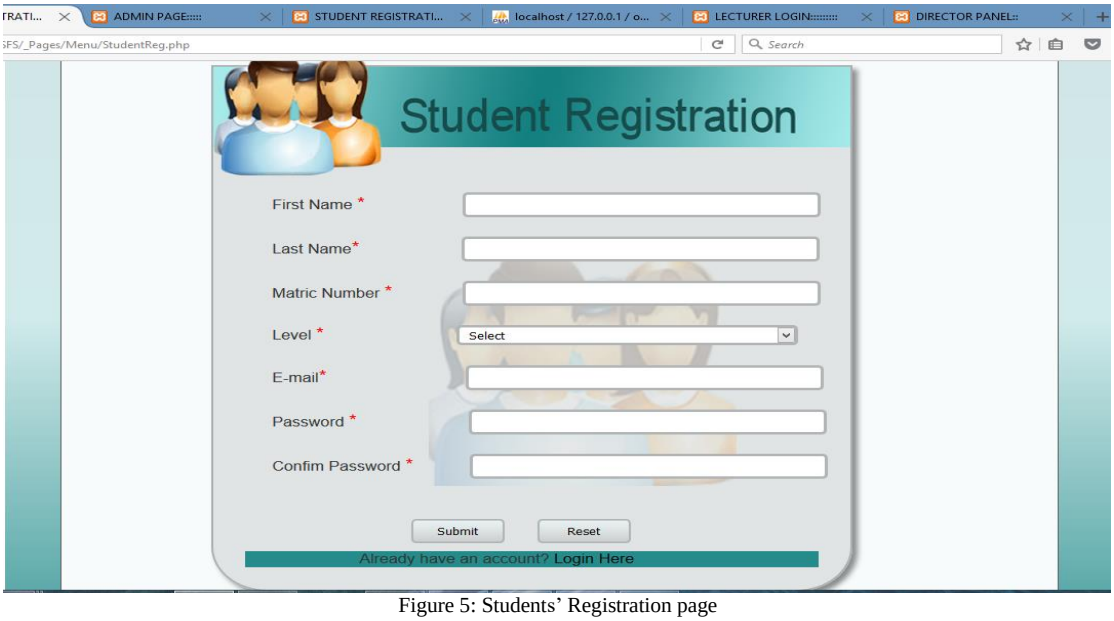

Figure 5: Students' Registration page

3.3.2 Lecturers Module

In the Lecturer module, the lecturers have the opportunity to register, login, view their registered details, check their rank and feedback given by students, give feedback on their taught courses, and also view their respective profile. Figure 6 shows the lecturer's registration / login page.

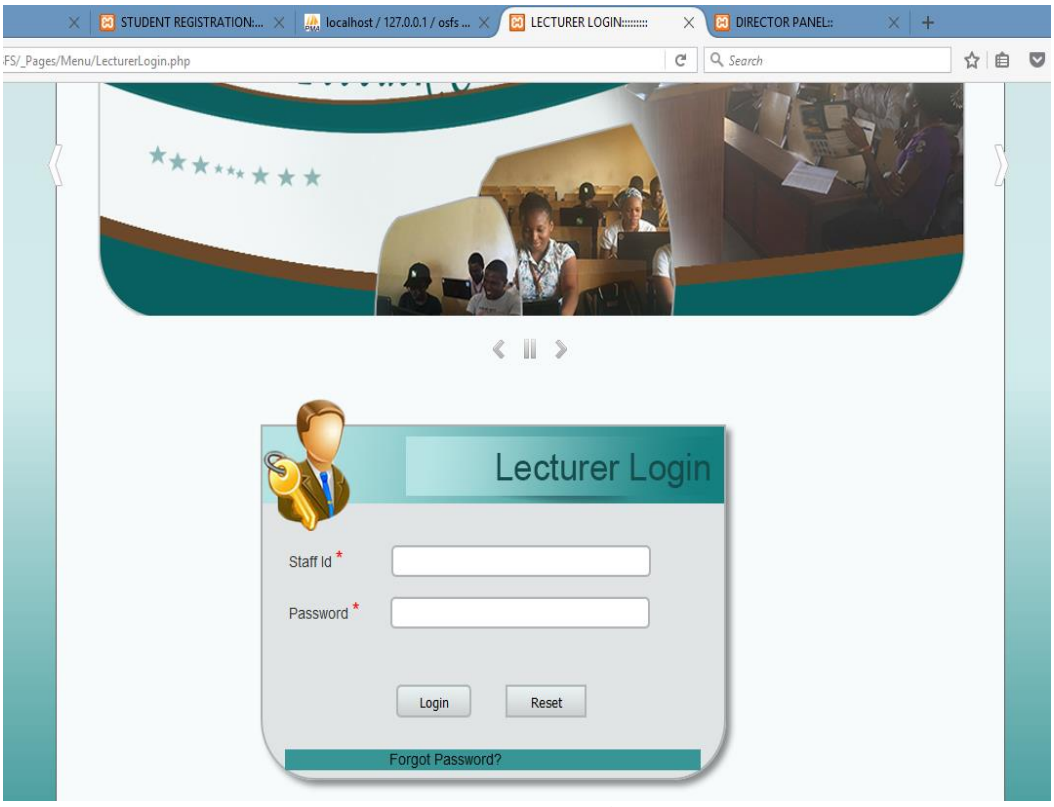

Figure 6: Lecturer's Login page

3.3.3 Director Academic Planning (DAP) Module

In the DAP module, the DAP is directly registered into the database by the administrator. S/he has the access, can login, check ranks of lecturers, and can also view the profiles of the registered lecturers. Figure 7 shows the DAP's login page, while Figures 8, 9, and 10 depict students' feedback on lecturers' assessment, departments, and infrastructure respectively.

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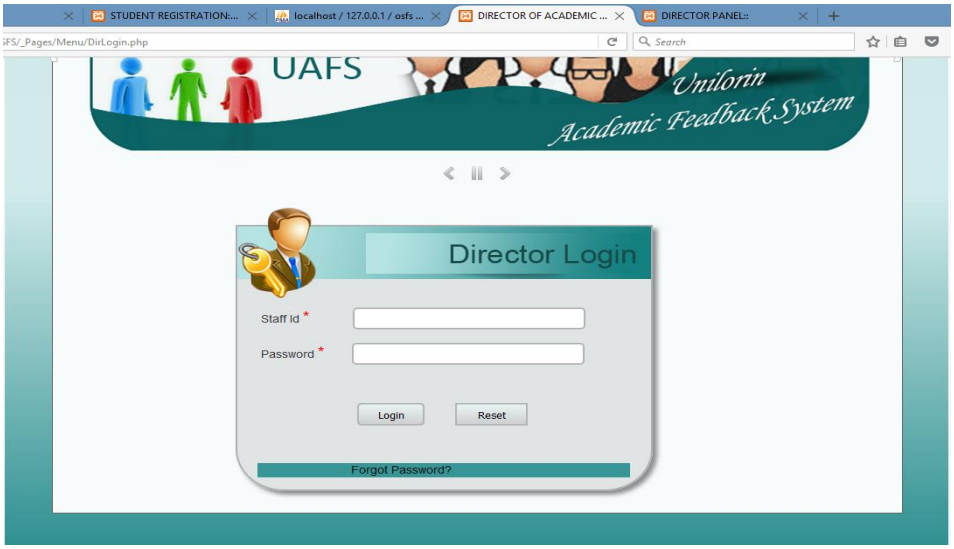

Figure 7: DAP's login page

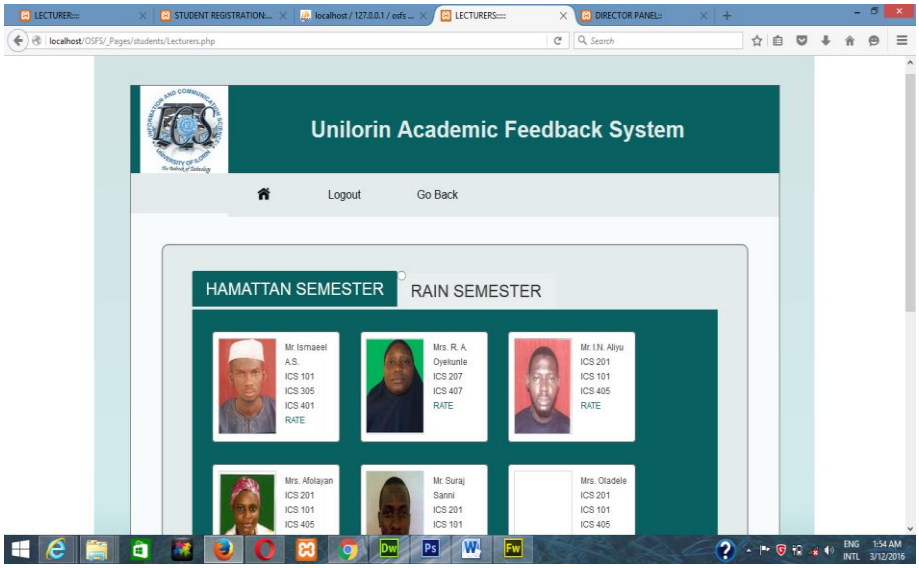

Figure 8: Students' feedback on lecturers' assessment

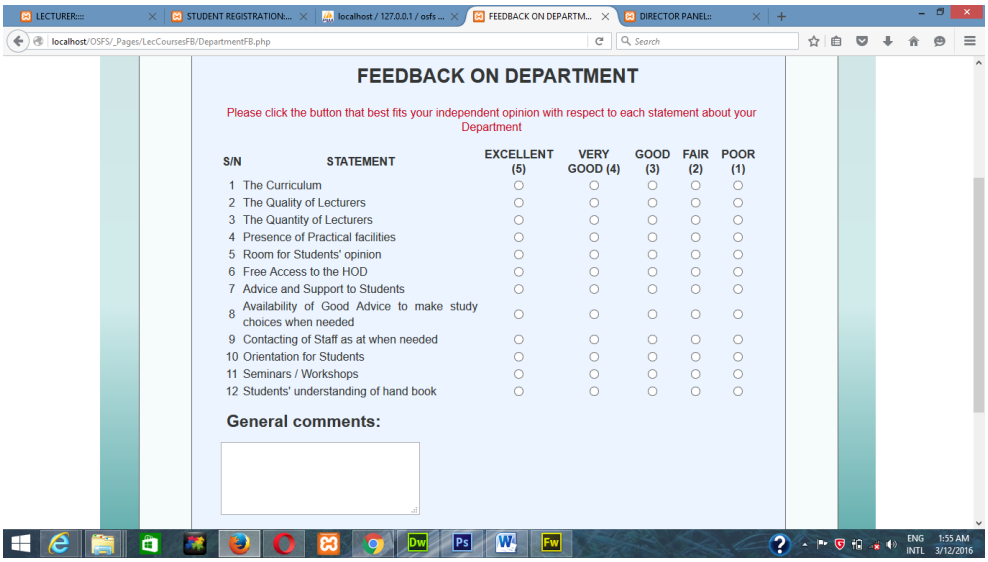

Figure 9: Students' feedback on department

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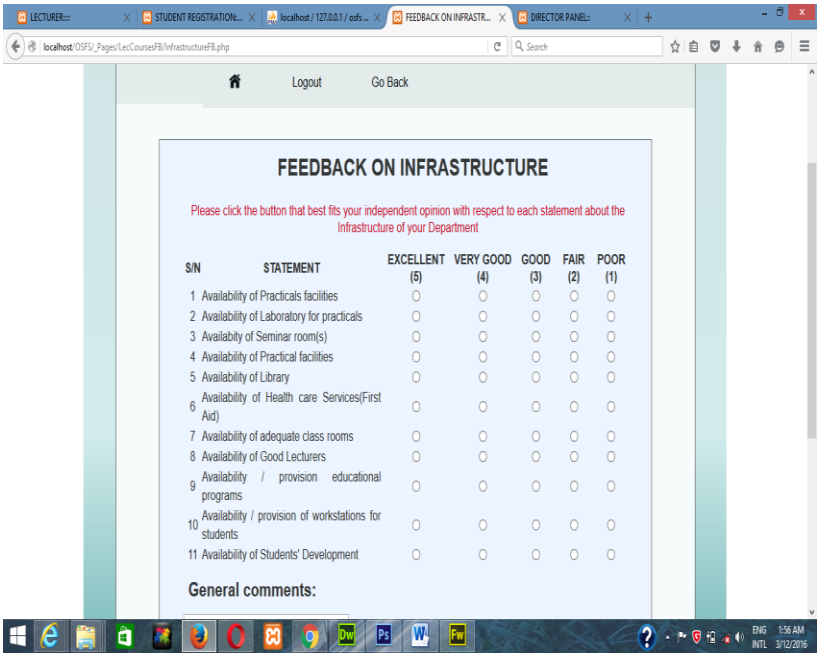

Figure 10: Students' feedback on infrastructure

3.3.4 Admin Module

In the admin module, the Administrator can login, check all feedback results by lecturers and students, edit questionnaire, view registered lecturers and also alter password if necessary. Figure 11 shows the Admin's login page.

Figure 11: Admin Login page

4.0 CONCLUSION

The purpose of designing an effective web-based feedback system is to evaluate the performance of academic staffs in higher institutions. Hence, in this study, a web-based feedback system has been designed which can be adopted by tertiary institutions. The web-based system involves student's feedback on individual academic staff about the various courses they teach. These feedbacks result to enhancing academic staff performance as regards teaching and lecturing. An added feature to the feedback system will be the opportunity for the management to view reports of students about academic staffs on the courses they teach. Expectedly, due to the benefits of the web-based feedback system, this study encourages that such system be deployed in tertiary institutions for effective staff academic performance. Also, the deployment of such system will enable the administration to render the strategic planning for the entire institution.

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