**CHAPTER ONE**

**INTRODUCTION**

**1.1 BACKGROUND OF STUDY**

In many tertiary institutions in the country, students seek a project in a given field of specialty as part of the upper level of their degree programme. Usually, a project can be filled by at most one student, though in some cases a project is suitable for more than one student to work on simultaneously. To give students something of a choice, there should be as wide a range of available projects as possible, and in any case the total number of project places should not be less than the total number of students. Typically a lecturer will also offer a range of projects, but does not necessarily expect that all will be taken up. (Williams Smith 2016).

Each student has preferences over the available projects that he/she finds acceptable, whilst a lecturer will normally have preferences over the students that he/she is willing to supervise. There may also be upper bounds on the number of students that can be assigned to a particular project, and the number of students that a given lecturer is willing to supervise. In this paper we consider the ways of allocating student project in our various institutions. (Ronald McCaffer 2009).

**1.2 MOTIVATION**

The traditional way of allocating project to students in our higher institution need to be reconsidered since project/research writing is sensitive aspect of student education in the higher institution.

Before now, lecturers ask students to go out and get project topics for themselves for approval. As a result of the traditional way of allocation project to students in the higher institution the motivation to come up with this project came about.

**1.3 PURPOSE OF THE STUDY**

The main aim of this project is to design a system that will minimize the inconsistencies and redundancies in project allocation.

The specific objectives include:

* To develop a system that will improve the existing method of allocating project student to supervisors
* To design a software that will curtail the high level of plagiarism by student during project research work
* To maintain a proper and computerise record keeping of student project work
  1. **METHODOLOGY**

The design of the new system will be achieved using Object Oriented Programming (OOP). The software required to design the new system includes Adobe Dreamweaver, the programming language that will be used comprises of Hypertext Mark-up Language(PHP), Java Scripts, and Cascading Style Sheet, the website will be tested on a local web server “Xampp” and Structured Query Language (SQL) is used for the Database design.

**1.5 SCOPE OF THE STUDY**

The research work will cover mainly the design and implementation of Student Project Allocation and Management system for the department of computer science in Kaduna Polytechnic.

**1.7 EXPECTED CONTRIBUTION TO KNOWLEDGE**

As a result of this project research and implementation, it is quite exciting to know that the following will be an added knowledge:

* How Student Project Allocation and Management system is being computerized and managed without redundancy or errors.
* How database is being created and linked to the programming language used.
* Understanding program design, coding and implementation.

**1.8 DEFINITION OF TERMS**

**Project management:** The discipline of carefully projecting or planning, organizing, monitoring, and controlling resources to achieve project goals under specific success criteria.

**Project Allocation:** To distribute project to a particular individual or group of persons for special research purposes.

**Software:** Software is a generic term used to describe a set of instruction called program which is used to direct all the activities of the computer.

**Algorithm:** This is a detailed set of step by step instruction for solving a given problem.

**Bug:** is a defect, an error, or flaw in a machine or computer program.

**Computer:** Any electronic machine that can be programmed to carry out a finite set of instructions. Such instructions could be arithmetic or logical operations.

**Computerization:** It involves carrying out a set of task with the aim of managing and controlling library operation using computer resources e.g. to store information in a computer system.

**Control:** Control involves monitoring and evaluating feedback to determine whether a system is moving towards the achievement of goals.

**Conversion:** This is the process of changing from an old or existing system to a new system.

**Common Dialog Boxes:** A set of windows dialog boxes available to Visual Basic programmers for open, fonts, colour, save and print.

**CPU:** The Central Processing Unit (CPU) is the part of a computer that performs operations and executes software commands.

**Debug:** it means to find and remove error in a computer program.

**Data:** This is a raw fact that can be processed by any computing machine.

**Database:** This is a systematically arranged collection of computer data, structured so that it can be automatically retrieved or manipulated.

**Form:** A form is said to be a template that is used to give a distinctive attribute/character considered apart from its content, colour, texture or composition.

Feedback: Is defined as data about performance of a system.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.1 INTRODUCTION**

A persisting change in human performance or performance potential Which must come about as a result of the learner’s experience and interaction with the world. This definition includes the attributes associated with the well-known learning theories - behaviourism, cognitive, and constructivism. These theories were established before the era of digital technology, therefore, the social media, networking technology, and information and communications technology (ICT) technologies leverage to sustain learning.Shankar Sankaran (Different Editors2010)

Thus, the development of learning theories during the past decades emerged different learning methods and approaches such as project based learning and networked learning. This means that the development of e-learning courses focuses on applying information and ICT to make possible new teaching and learning

Scenarios. (Chien-HoKo 2011)

**2.2 PROJECT-BASED LEARNING (PBL)**

Project-Based Learning (PBL) has been highly recognized as a learning method that overcomes the limitations of traditional pedagogies.(Dr Steven D. Eppinger Sloan 2013). Learning is moving towards social-constructivist paradigm, which is a student-centred approach considering the student as an "Active Learner".

Researchers have clearly specified the requirements of project-based learning and have put forward criteria for applying PBL in education.

PBL must be involved with real-world problems requiring problem solving and creative decision making with minimal directions from the teacher. Additionally,

(Miroslaw Skibniewski 2012).

Specified five important features for project-based learning as follows: centrality, driving question, constructive, investigations, autonomy, and realism.

Used these features in a recent paper to integrate PBL with competitions resulting in a framework called "Competition-Based Learning".

Another student-cantered approach that takes advantage of recent popularity of web technologies and social network applications is Networked Learning. Learning in which ICT is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources. Thus, many institutes initiate Learning Management Systems platform (LMS) and/or Content (Course) Management Systems (CMS) platforms in teaching courses. Networked-Learning is facilitated using a "network environment" which provides connections amongst a group of learners, learners and teachers, and a group of teachers. (Mohan Kumara Swamy 2011)

It is basically a physical connection (environment) that allows connected people to distribute and share learning over space and time. One of the advantages of using networked learning is the ability of researchers to investigate the levels of participation between users using Social Network Analysis (SNA) (Mustafa Alshawi 2007/2011).

Relationships amongst a group of people can be visualized using diagrams and analyzed using mathematical measures such as density and centrality. This research employs social constructivism learning theory using Model platform that supports a social constructivist framework of education, project-based and networked learning methods in developing the graduation project management system. This is because the graduation project plays a significant role for students in their professional career; therefore the intended system aims to support educational planning and management issues in the graduation project course. Moreover, a case study has been presented in this paper to evaluate the effectiveness of the system. This has been performed using SNA techniques to understand the communication of the leaning networks for the case study. (Ronald McCaffer 2009).

**2.3 GRADUATION-PROJECT COURSE**

Most of the undergraduate Computer Science programs require an obligatory "Graduation-Project" course to be taken by students at the third or fourth year of study. Each student is required to develop a project, implement a prototype system, and write a research report in one semester. At the end of the semester, the designated assessment committee grades student’s work according to how the students present their work and defend it. At the beginning of every semester, students enrolled in the “Graduation- Project“ subject are grouped in teams formed by three to five students and assigned a supervisor on acceptance of their project proposal. Supervisors should assist their students in identifying and acquiring the knowledge and skills needed to complete the project, and to guide them through the main phases of the graduation projects life cycle i.e. specification, design, implementation, and conclude with testing and evaluation. . (Dr Steven D. Eppinger Sloan 2013)

As experience shows, planning and management play a great role in the quality of education especially in courses such as the graduation project, where managing these projects is a real challenge for all participants including students, supervisors and the graduation project committee members. Students struggle with their projects to meet deadlines, and to have their deliverables on time. (Avan Michael 2012).

Consequently, supervisors and other participants will be involved to track students’ work and progress. Hence, a graduation project management system may be useful in managing the work included in the graduation projects (Avan Michael 2012).

**2.4 GRADUATION PROJECT COURSE PARTICIPANTS**

The Graduation Project Committee (GPC) is in charge of organizing, scheduling, and monitoring the graduation project course during the semester. At the start of each semester, the committee provides the general themes and ideas to the student to use them in choosing their graduation project topicFurthermore, subsequent to the submission of projects' proposal the committee review and evaluate the projects' proposals for acceptance and then assign a supervisor for each accepted project. In addition, the GPC is responsible of confirming the students' final marks at the end of each semester. (Bryman and Bell 2017)

The second participant in the learning network is the Student/Team. The student has to register in the graduation project course and a team of students can collaborate in accomplishing the graduation project. The teams can be formed either as a self-organized team where the students create the team or an assigned-team where the graduation project committee creates the team and assigned number of students to work together. All members of the group have to know the phases of the graduation project lifecycle. (Manslow Sheenan 2011)

This study didn’t consider the communication within the members of one team or between different teams; however, it considered the communication between a team and other participants that are involved in supervising, managing or assessing the graduation project course. The next participant, an academic supervisor: is a faculty member that supervises a team and his responsibility is to monitor student progress and to make sure that deadlines are being met. For examples, the supervisor can assist in: helping students in understanding the problem, how it should be accomplished, facilitating each step of the graduation project process, and monitoring the students' progress during the development of graduation project. The technical mentor participant is a faculty member who assists students in solving technical problems during the development of their projects. Finally, an assessment committee (examiners) participant is formed by the graduation project committee and approved by the Dean. The assessment committee is responsible for grading and evaluating students' work and the final grades are sent to the GPC. The committee comprised of: supervisor, three faculty members, and a member from the innovation canter. (Manslow Sheenan 2011)

**2.4.1 Choose a problem/Idea**

Graduation project themes and ideas are developed by the Graduation Project Committee (GPC).

Subsequent to the submission of projects' proposal the committee reviews and evaluates the projects' proposals for acceptance, and then assigns a supervisor for each accepted project.

In most cases, student graduation group is composed of three to five registered students. (Francis steven 2014)

**2.4.2 Plan and Trawl System Requirements**

This activity relates to defining each major task, estimating the time and resources required.

Also in this activity, requirements elicitation, functional and non-functional requirements are specified. (Francis Steven 2014)

**2.4.3 Analyse and Design the System**

This activity relates to utilizing an object-oriented approach in analysing and designing the underlying system. This phase includes also the design of all the necessary hardware. ((Francis Steven 2014).

**2.4.4 Implement and Test the System**

In this activity, students utilize their programming skills to produce the code (i.e. product) which is the main focus of the developer. Then, the generated code has to be tested against the requirements to make sure that the product is actually solving the needs gathered during the requirements phase. A complete system test that includes both software and hardware is accomplished. (Derek 2017)

**2.4.5 Submit Documentation**

Students have to submit a full documentation of their project phases. At the end of each phase each supervisor evaluates and grades the students' work. (Derek 2017)

**2.4.6 Evaluate Project**

Students have to present their work, and answer questions posted from the assessment committee. Project assessment is a multi-criteria process which focuses not only on the overall project outcomes, but also on each individual team member.

The project management system is mainly focused on implementing the following functionalities:

* Manage the submission and evaluation phases of the graduation project deliverables.
* Provide students with means of communication with participants (i.e GPC, supervisors, and examiners) by different techniques such as chatting, instant messaging, emails, and forums.
* Allow students to access essential graduation project learning resources and documentations.
* And also curtail plagiarism and repetition of project work by student. (miroslaw2012)

**2.5.1 Review of Related Literatures**

The fundamental tasks of research are describing, explaining and analyzing. Describing addresses, the ‘who, what and how’ questions, and explaining and analyzing the ‘why’ questions. ‘Research is the process of systematically obtaining accurate answers to significant and pertinent questions. (Balsley and Clover 2016)

**2.5.2 Project Researcher and Supervisor**

According to (Anderson et al., 2016), at the heart of a successful research project is the relationship between the researcher and the supervisor. This relationship requires mutual respect and adaptability on both sides to the changing balance between the academic needs and independence of the researcher, the expectations of the supervisor and the requirements of the Institute. A Learning Agreement is a tool to help facilitate the relationship between researcher and supervisor. It encourages both parties to develop a thorough understanding of their individual and shared roles and responsibilities, and is drawn up to make each party’s expectations explicit. Both parties should give some consideration to the Learning Agreement before the first meeting, when it should be drawn up. Wisker (2015)

**2.5.3 The Roles of the Research Supervisor and the Research Student**

The relationship between the student and supervisor is a very important one. (Wisker 2015) states that students need to be able to work with their supervisors, and supervisors with their students, to ensure the experience is rewarding for all concerned. The relationship needs to be based on respect and honesty and open dialogue. However, the supervisor/student relationship is fraught with difficulties if the expectations of either side are not aligned with the other. The Learning Agreement aims to establish a clear relationship between student and supervisor with defined parameters right from the start. It does this by seeking to clarify the roles of both parties in order to clear up any misunderstandings that could arise during the project and result in unfinished or poor quality work (Williams Smith 2010).

**2.5.4. The Role of the Supervisor**

Supervising research requires that supervisors develop a range of research-related and interpersonal skills to allow them to nurture, support and encourage independence in their students.

The Minimum input expected from supervisor:

* Hold an initial face-to-face meeting at the start of the research project
* Have good knowledge of the research area and be able to put students in touch with information, reading, contacts and internet sites
* Have good knowledge of the supervision process
* Hold further meetings to review progress throughout the research project
* Review and comment constructively on the first draft, if submitted in good time
* Respond to all email and telephone contact within a reasonable time period - Mark the research project

The supervisor can reasonably expect the student to show independence; be honest about how the research is progressing; to produce quality written work and to meet commitments, or be prepared to explain why. (Bryman 2017)

**2.5.6 The Role of the Student**

Students expect to be supervised and thus guided through the research process. The student is entitled to expect constructive criticism; guidance, suggestions, advice and ideas; guidance with literature; support and direction. (Wisker 2015) states that, ‘Ultimately, it is up to the students to manage the project and their time and to have a clear idea of their goals and how they are to achieve them’.

The Minimum input expected from the research student:

* To be responsible for their own research
* Make the first contact to arrange initial meeting once the supervisor is allocated
* Set up and agree dates for progress meetings with supervisor
* Set up and agree the date of delivery of the first draft

Set up and agree a date to receive feedback on first draft (Wisker 2015).