CHAPTER III

METHODOLOGY

The research was conducted through following a series of procedural step to be able to obtain all the needed information for the implementation of the proposed system. Looking into the different modes on how Virtual Learning Environments are used and implemented, a mode of observation and testing the system was done to fully get an overview if the system to be developed would be probable for development and if its feasibility can be able to allow the definition that would be used for the research.

After going through the observation state, it was then determined that the basic idea of using the System Development Life Cycle methodology, specifically, the Iterative Model would be used as the methodology for the system development.

This method allows the development of a system through repeated cycles (iterative) and in smaller portions at a time (incremental), allowing software to take advantage of what was learned during development of earlier parts or versions of the system. Learning comes from both the development and use of the system, where possible key steps in the process start with a simple implementation of a subset of the software requirements and iteratively enhance the evolving versions until the full system is implemented. At iteration, design modifications are made and new functional capabilities are added.

The iterative model as shown in Figure 6.0 is consists of six (6) different phases that includes: the planning phase, requirements phase, design phase, implementation and test phase, and the deployment phase.

**Implementation**

Figure 6. System Development Life Cycle: Iterative Life Cycle Model

*Planning Phase*

As designers of learning environments, teachers can choose any mix and ordering of Knowledge Processes. The purpose of indicating the Knowledge Process underlying each activity is to prompt teachers to think explicitly about the most appropriate range and sequence of learning activities for their students and subject matter.

*Analysis Phase*

The phase was able to undergo analysis as per requirements gathered to be able to assess the need of the system to be developed. Through these analysis phase, it has been found out, based on the feedback made by programming teachers in the College of Computer Studies. No instrument was developed to acquire data from the Instructors that were asked, but the basis was made through the gradebook of the faculty who handled programming subjects.

Based on the gradebook, students tend to miss out laboratory exercises as they have trouble catching up with the topics, even though that they have enough learning materials that was provided for them. Also tutorial classes were held, which may had helped the students having difficulty, but on analysis these situations, students may be able to go about learning on their own with the design of the system that is to be developed.

*Design*

The CAI Learning platform combines text, audio, and visual elements and coding, specifically for this system developed to engage students in learning. At this stage, the system will present a content-based system focused mainly on programming. Drills and practice, lesson mode, simulation, r discovery mode are all used depending on the type of programming concept being focused on to be developed. The program has relevant assessment measures that are inherited in accordance with the presenting method. After following each stage, the student gains the necessary knowledge in the targeted field and will be assessed based on the performance tracking and assessment module of the system.

*Implementation*

In this stage, the researcher started to analyze and design the database and logic for each modules mentioned. For the Homepage, classroom management of the courses to be offered are presented to be made available for the users of the system, for the administrator, instructor and the students. A registration module was designed wherein users enter the data required to be able to gain access to the system, especially to the student users who may need to use the system. The system will then send a verification through the email address that they entered. In this email, a generated password is given to the user to be used upon login into the system. After logging-in the user is can change the password.

A use case, sequence and activity diagrams were created to show the flow of transition from one module unto another. The detailed design of each module was illustrated through the activity diagram that was created.

*Deployment*

To be discussed.