Chapter 3
Methodology

3.1 Introduction

To conduct this research, the researcher implied two methods that included surveys and prototyping; for the purpose of data collection the questionnaire was conducted to evaluate the existing student affairs services for e-learning students in major Malaysian Universities (UM, UPM, UTM, USM, UKM, MMU, UNITAR and Open University). The researcher personally traveled to these universities and distributed the questionnaires among the students with the help of his friends and enumerators. I would like to thanks to my friends (Dr. Golnaz Rezai and Dr. Abdullahi from UPM, Mrs. Tina Haghighat from USM, Mrs. Zohreh Naimi from UM and Mr. Javad Tizmaghz from MMU) for assisting me during data collection.

According to Bennett et al (2002) a prototype is a system or partially completed system that is built quickly to explore some aspects of the system requirements. It is used to visualize a concept and it is not intended as the final working system. In order to test the assumptions a prototype system for student affairs administration of e-learning will be developed, a set of administration guidelines for student affairs administrators to improve their administrative skills will be considered. The design and implementation of prototype will be discussed in chapter 4 and 5.

3.2 Conceptual Framework
The model for this study is adopted from the Linear Sequential Model or the Classic Life Cycle or the Waterfall Model (Pressman, 2001). Figure 3.1 shows the steps that should be followed to develop a software system in the Linear Sequential Model. In the first phase of this model the requirements and need of the clients will be clarified and estimated. Besides feasibility report with recommendations will be submitted. The most important phase is the second phase because during this phase the overall structure of the software system will be designed and the relationships among different components were defined. According to the needs of the project the third phased will be designed. It is about coding and language that will be selected to translate the design in the machine language. Code can also be automatically generated by the tools that are easily available everywhere. By the end of this phase raw executable system is ready to be tested. After the coding process testing software will perform to check whether the software meets its requirements or not. Since the application of this study is relatively small and simple this model is chosen. For example there is no complexity in two main parts of the application (e.g. Data Extraction Application and Data Transformation Application).

![Diagram: Linear Sequential Model]

**Figure 3.1: the Linear Sequential Model**

Although the benefits of e-learning have been discussed in various previous studies; it is a critical issue to find how student affairs department provides and fulfills the students’ needs and requirements in universities. Therefore, this research investigates learners’ satisfaction, behavioral intentions, and the effectiveness of the student affairs department with e-learning system.
3.3 Sampling Frame and Questionnaire Design

Students’ needs, requirements and their attitude towards e-learning program are affected by their characteristics such as socioeconomic/demographic characteristics and attitudes. The data applied in this study were collected by the research team from 8 major public and private universities (UM, UPM, UKM, USM, UTM, MMU, OUM and UNITAR) with a face-to-face survey in 2007. The sample size was determined by ungrouped one stage random likelihood sampling method (Collins, 1986):

\[ n = t^2[1+(0.02)(b-1)]*p_q/E^2 \]  \hspace{1cm} (1)

where \( n \) is the sample size, \( t \) is the significance level (assumed to be 95%), \( b \) is the stage of sampling and \( p \) is the probability of the situation being searched (for this study, it is assumed to be 50%), \( q \) is the probability of the situation not being searched \((1−p)\), and \( E \) is the accepted error (assumed to be 5%). If \( b \) is equal to 1, the Eq. 1 is transformed to the following equation:

\[ n = (t^2*p_q)/E^2 \] \hspace{1cm} (2)

\[ n = \frac{1.96^2 \times (0.5 \times 0.5)}{(0.05)^2} = 384 \] \hspace{1cm} (3)

To round out, a total of 400 university students were surveyed via structured questionnaire to find out their level of satisfaction and the effectiveness of the student affairs department with e-learning system. In this study both groups of students (traditional and e-learning) were selected randomly from UM, UPM, UKM, USM,
UTM, MMU, OUM and UNITAR. Although among those universities, Open University (OUM) and UNITAR are fully providing e-learning program, yet there is a need to explore how other group of students perceive the e-learning program. In addition the student affairs department plays a key role in this program and it is essential to find out to what extent the students are aware of this role.

The questionnaire used in the survey, was structured in two sections and contained straightforward questions. In the first section, the students collected data on respondents’ socio-economic/demographic characteristics (e.g., age, education, residential area and employment status).

The second section included attitudinal subjects such as satisfaction, perceptions and attitudes toward student affairs department for e-learning system and the awareness of the duty and responsibilities of student affairs department for e-learning system. A Likert scale of 1 to 5 was used to measure students’ satisfaction and awareness on the statements formulated in relation to student affairs department for e-learning system. As mentioned earlier a random sampling method was used in the study to obtain information from groups of student who could provide the desired information. Eight major universities were chosen due to the fact that they are very famous and well-known among Malaysian students meanwhile they practice distance learning. Although the distance learning is different from e-learning but it can still be used as a measurement of students’ expectations towards student affair department.
3.4 Analysis and System Design

3.4.1. Descriptive Analysis

Descriptive analysis was applied to identify the socio-economic/demographic characteristics and level of satisfaction, attitude and awareness of students toward student affairs department for e-learning system. This study used the data collected from a students’ survey which was conducted in Peninsular Malaysia. Four hundred respondents were surveyed to gauge their perception and awareness toward student affairs department for e-learning system. Descriptive analysis was used to produce a situation analysis which consists of national or sub-national level information such as residential area, gender, race, age, education level and occupation to name a few. This data provides a snap shot of the situation of the samples under study. The relationship between the students’ perception and attitude were also measured by descriptive analysis. Students were asked about the frequency of referring to their university websites.

3.4.2. Developing System (Software and Hardware)

The software tool used to build this application was the Java Server Page (JSP) technology which is a very user-friendly development tool that supported by all Internet browsers. Hardware requirements for the development of this application were:

- Windows XP or VISTA operating system
- Normal processor
- 512 MB of RAM (Minimum)
- 500 MB of hard disk space (Minimum)
- CD-ROM / DVD-ROM driver
Software design based on Linear Sequential Model is desirable approach when the requirements are clear and well understood at the beginning. It provides a clear cut template for analysis, design, coding, testing and support. It is also an enforced disciplined approach because in this model each phase well defined starting and ending point, with identifiable deliveries to the next phase.

After revealing the students’ attitude towards student affairs department and exploring their needs and requirements, this study will provide a more efficient way of communication between students and their affair department. Therefore it would be much easier to submit, observe and learn the progress of any requirements.