**CHAPTER TWO**

2.1 **LITERATURE REVIEW**

Using Bayesian methods to apply computational models of cognitive processes, or Bayesian cognitive modeling, is an important new trend in psychological research. The rise of Bayesian cognitive modeling has been accelerated by the introduction of software such as Stan and PyMC3 that efficiently automates the Markov chain Monte Carlo (MCMC) sampling used for Bayesian model fitting. Unfortunately, Bayesian cognitive models can struggle to pass the computational checks required of all Bayesian models. If any failures are left undetected, inferences about cognition based on model output may be biased or incorrect. As such, Bayesian cognitive models almost always require troubleshooting before being used for inference. Here, we present a deep treatment of the diagnostic checks and procedures that are critical for effective troubleshooting, but are often left underspecified by tutorial papers. After a conceptual introduction to Bayesian cognitive modeling and MCMC sampling, we outline the diagnostic metrics, procedures, and plots necessary to identify problems in model output with an emphasis on how these requirements have recently been improved. Throughout, we explain how the most commonly encountered problems may be remedied with specific, practical solutions. We also introduce matstanlib, our MATLAB modeling support library, and demonstrate how it facilitates troubleshooting of an example hierarchical Bayesian model of reinforcement learning implemented in Stan. With this comprehensive guide to techniques for detecting, identifying, and overcoming problems in fitting Bayesian cognitive models, psychologists across subfields can more confidently build and use Bayesian cognitive models. (B. Baribault Et al, 2019).

The prior research on Power Electronics education is mostly focused on improving the experimental skills of the students while the key contribution of this research is introducing the real world limitations and non-technical aspects in power electronics projects to students under tutorial activities, supported by the evidence of its validity in the power electronics course at two Australian universities, over four academic years. In many electrical engineering curricula, Power Electronics is a course, offered to year-3 or 4 undergraduate students. Prior research on Power Electronics education has been focused on developing practical experiments, laboratory activities, and problem/project-based learning. However, an instructional approach, that employs real-world knowledge and skills in this course, is worthy to be evaluated. The specific intended outcomes are that the students can apply the theories when designing power electronic circuits and converters while considering real-world technical and non-technical limitations, and can select and carry out appropriate tests to troubleshoot circuits. Prior research on engineering education have emphasized the importance of introducing real-world limitations to the students as part of their curriculum. As such, in this research, it is suggested that the tutorial activities in the Power Electronics course are presented such that they help the students build up skills in designing and troubleshooting a circuit or system according to desired technical aspects, real-world limitations and the available data from various resources. An analysis of the grades of the students’ course project shows that the students treated with the new tutorial activities have achieved higher grades than those who attended the traditional tutorials. Another evaluation reveals the vibrant participation of the students in the activities during the new tutorial sessions. (F Shahnia Et al, 2019).

One of the learning challenges during the Covid-19 pandemic is the low mastery of material by students, especially abstract material such as statistics. As an alternative solution, statistical learning is carried out using problem solving video tutorials assisted by SPSS to further measure its effectiveness on academic performance. This type of research is true-experimental with Posttest Only Control Design. The sample of this study was students of the management study program of the Faculty of Social and Political Sciences, Ninebelas November Kolaka University who took statistics courses in the odd semester of the 2020 Academic Year which consisted of two classes, namely class C with 32 students and class D with 33 students. The instrument used is a learning achievement test in the form of an essay. The research data were analyzed using one sample t-test and independent sample t-test. The results of data analysis showed that the statistical performance of students taught using SPSS-assisted videos was better than those taught using learning modules. (A. Arbain, 2021).

This paper presents a survey on the activities carried out during tutorial sessions at two Australian universities to improve the learning experience of electrical engineering undergraduate students in the power electronics unit. The unit is conducted based on lectures, tutorials, and computer-based laboratories. In the academic year of 2014, to improve the learning experience of students, different types of tutorial sessions were developed aiming at improving the students’ expertise in designing and troubleshooting power electronics-based circuits and converters, as well as obtaining information from datasheet, catalogues and articles. This paper discusses the students’ satisfaction from each of these types of tutorial sessions over the last 4 years. (F Shahnia Et al, 2017).

Seeking to address the challenges of increased need for distance education course offerings and the transformation of library involvement in information literacy instruction, academic librarians in a teaching and learning department collaborated with a system wide office of online education and an online instructional design and development team to develop a tutorial module for online course instructors. Embedded in the Canvas learning management system, the module moves beyond traditional library orientation to focus on assignment design and strategic use of library resources. The author anticipates that this tutorial project will open new doors for meaningful teaching partnerships that foster student-centered pedagogies. Pursuing partnerships with localized teaching and learning centers and with other institutional units opens opportunities for integrating information literacy across the curriculum, within and beyond distributed learning environments. (M. Courtney, 2017).

According to (Jordan L. Couch, 2019) for any question you have or issue you face, you can be confident that the answers are out there. The internet currently has more than 3 billion users (about half the world’s population) who have contributed about 1,500 petabytes of data. No matter how unique or complex your problem, its statistically unimaginable that someone else hasn’t had same problem and an answer isn’t somewhere in that voluminous data. I tell this story because it leads me to a confession. Throughout my professional career, I have often been seen as the “tech guru” in my office; people often come to me to troubleshoot their tech problems. While it’s true that I can usually solve their problems, I am not a guru. I have no training; I just have google, much like a skilled lawyer has learned how to search for key cases, I have learned how to search for tech solutions. This same skill will treat you well when it comes to troubleshooting your tech problems. Do you want to change the default font size on your desktop? Just type “Change default font size on desktop” into Google, and you’ll find a quick answer. Want to know what to do when an error message pops up on your screen? Copy and paste the text of that error message into your search bar and see what comes up. The yardstick is that just tell google your problem.

2.2 **DATA AND INFORMATION**

**DATA**

Data is any sequence of one or more symbols; datum is a single symbol of data. Data requires interpretation to become information. Digital data is data that is represented using the binary number system of ones and zeros, instead of analog representation. In modern computer systems, all data is digital. Data are individual facts, statistics, or items of information, often numeric. In a more technical sense, data are a set of values of qualitative or quantitative variables about one or more persons or objects, while a datum is a single value of a single variable. (Wikipedia contributors, 2022)

**INFORMATION**

Information is processed, organized and structured data. It provides context for data and enables decision making processes. For example, a single customer’s sale at a restaurant is data – this becomes information when the business is able to identify the most popular or least popular dish. Information is organized or classified data, which has some meaningful values for the receiver. Information is the processed data on which decisions and actions are based. (Wikipedia contributors, 2022)

2.3 **ANALYSIS OF THE EXISTING SYSTEM**

It is a common scenario that people die in event of an accident as a result of delay or lack

of medical attention. Accident victims have to rely in eye witness to call ambulance or “word of

mouth”. One of the drawbacks of this existing method is that people must be present where

accidents occur. Few sensors are able to capture a wide variety of movement.

After the research conducted from the literature review and journals, it has been revealed

that sensors such as accelerometers, heartbeat sensors, tilt meters etc. have been embedded into

vehicles or user’s body. Other methods used are 5G wireless technology, global positioning

system to know the exact location of the vehicle.

It is a common scenario that people visit libraries or read text books or even product manual when faced with microcomputer problems. Flipping through pages would take a considerable amount of time when searching for solutions to problems with microcomputers. Users, engineers or technical personnel would be stuck for days on a particular problem, not having an idea of what’s happening to their system neither do they have the right clue on how to solve the problem, in such scenario the only option is going by trial by errors which is definitely inappropriate. The proposed system builds on (Jordan L. Couch, 2019) approach of just tell google your troubleshooting problems, the proposed system tends to build a central knowledge base of tutorial from experts in microcomputer troubleshooting where they can publish articles on specific microcomputer problem.

2.4 **THE PROPOSED SYSTEM**

The project is a contribution to all-important aspect of the Computer age. It is to provide intelligent information to user engineers, technical personnel and any other person concerned with types of faults, analysis of faults, as maintenance's routine in microcomputers. He/she need to go to the background bringing of computers tells the present day microcomputer. Besides, the use of computers system enhancing practical training was employed though a computer application-programming computer aided or assisted learning (CAL). A brief history of this application tells present day was carried out. This package is thus a web project developed using python which is a modern programming language which is further implement using Django as the web framework for python, not forgetting the database which is implemented using SQLite, the proposed system covers peripherals such as disk drives, display unit system board (mother board) and other input and output units. This software is designed to provide intelligent information to readers, engineers, technical personal and any other computer used concerned with the power functional types of faults, possible cases of these faults, possible corrective measures as well as maintenance routine that can be carried out on microcomputers.