

G  
DA  
HOB  
1540  
WDT  
M38



**AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT  
DAWAN NATIONAL HIGH SCHOOL**

**ROMIE MATANGCAS  
CARL PATRICK G. DUERO  
SHECHEM D. DINDIN**

**BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**JUNE 2022**

11A605

### APPROVAL SHEET

The BSIT Capstone project herein attached entitled "**AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL**," prepared and submitted by **ROMIE MATANGCAS, CARL PATRICK G. DUERO, and SHECHEM D. DINDIN**, is hereby recommended for approval and acceptance.

Endorsed by:

WILKIN F. SIMO, MIT  
Adviser  
07-15-2022  
Date

Approved by the Panel Members.

JUNEE WARREN M. RIOGELON, MERE

Chair

7-16-2022  
Date

RAY JOHN A. SALIMACO, MIT  
Member

7-5-2022  
Date

DEMOSTHENES F. MANGUIOB

Member

7-8-2022  
Date

Accepted in partial fulfilment of the requirements for the degree in Bachelor of Science in Information Technology.

LANIE B. LAUREANO, MIT  
Capstone Project Coordinator

EMMANUEL B. BARBAS D. Eng.  
Dean, Institute of Computing and Engineering

7/11/2022  
Date

ROSELYN V. REGINO, Ph.D.  
Director for Instruction

07/20/2022  
Date

## TABLE OF CONTENTS

TITLE	PAGE
Title.....	i
Academic Integrity Declaration.....	ii
Approval Sheet.....	iii
Acknowledgement.....	iv
Table Of Contents.....	v
List Of Tables.....	ix
List of Figures.....	xi
List Of Appendices.....	xii
Abstract.....	xiv
<b>CHAPTER I INTRODUCTION</b>	
1.1 Rationale.....	1
1.2 Purpose and Project Description.....	2
1.3 Objectives of the Study.....	2
1.3.1 General Objective.....	2
1.4 Significance of the Study.....	3
1.5 Scope and Limitation.....	3
1.5.1 Scope.....	3
1.5.2 Limitations.....	4
1.6 Conceptual Framework.....	5
1.7 Definition of Terms.....	6
<b>CHAPTER II REVIEW OF RELATED LITERATURE</b>	
2.1 Technical Background.....	7
2.1.1 Bootstrap.....	7
2.1.2 CSS (Cascading Style Sheet).....	7
2.1.3 JavaScript.....	8
2.1.4 PHP.....	8
2.1.5 SQL.....	8
2.1.6 Barcode to PC.....	8
2.2 Review Related Literature.....	9

2.2.1 Modular Learning System.....	9
2.2.2 Technical Element.....	10
2.2.3 Students.....	11
2.2.4 Teacher.....	12
2.2.5 Modular Learning System amidst Pandemic.....	14
2.2.6 Barcoding.....	15
2.3 Review-Related System.....	16
2.3.1 Monitoring Students' Learning.....	16
2.3.2 Electronic Document Tracking System (EDTS).....	17
2.3.3 Student Attendance System by Barcode Scan.....	18
2.3.4 School Event Attendance Monitoring System .....	19
2.3.5 Based Document Tracking and Management System.....	19
2.3.6 Student Identification Monitoring System Using Barcode.....	20
2.4 Synthesis.....	21

### **CHAPTER III MATERIALS AND METHODS**

3.1 Software Methodology.....	22
3.2 Requirements Analysis.....	24
3.2.1 Documentation of the Current System.....	24
3.3 System Architecture.....	25
3.3.2 Requirements Specification.....	25
3.3.2.1 System Perspective.....	26
3.3.2.2 System Features.....	26
3.3.2.2.1 Web Application.....	26
3.3.2.3 User Classes and Characteristics.....	26
3.3.2.4 Operating Environment.....	26
3.3.2.4.1 Software Components.....	27
3.3.2.5 Design and Implementation Constraints.....	27
3.3.2.6 User Documentation.....	27
3.3.2.7 Other non-functional requirements.....	27
3.3.2.7.1 Safety Requirements.....	27
3.3.2.7.2 Security Requirements.....	28

3.3.2.7.3 Software Quality Attributes.....	28
3.3.2.7.3.1 Reliability.....	28
3.3.2.7.3.2 Efficiency.....	28
3.3.2.7.3.3 Usability.....	29
3.4 Design.....	29
3.4.1 Use Case Diagram.....	29
3.4.1.1 Use Case Descriptions.....	30
3.4.1.1.1 Sign up.....	30
3.4.1.1.2 Login.....	31
3.4.1.1.3 Add Class.....	31
3.4.1.1.4 Add & Remove Module.....	32
3.4.1.1.5 Add & Remove Students.....	32
3.4.2 Entity Relationship Diagram.....	33
3.4.3 Graphic User Interface (GUI) Design.....	33
3.4.3.1 Website GUI Design.....	34
3.5 Development and Testing.....	38
3.5.1 Data Analysis Plan.....	38

#### **CHAPTER IV RESULT AND DISCUSSION**

4.1 Achievement per Objective.....	39
4.1.1 Development of the System.....	39
4.1.1.1 Provide modifications such as adding, saving and updating the modules and students.....	39
4.1.1.2 Provide a database for the records of all student module transactions.....	40
4.1.1.3 Generate a list of modules.....	41
4.1.1.4 Generate a list and data of the students.....	42
4.1.1.5 Provide a summary report of all the module records.....	43
4.1.1.6 Provide a summary report of every student's records.....	43
4.1.1.7 Provide a Barcode for every module.....	44

**CHAPTER V SUMMARY, CONCLUSION, AND RECOMMENDATION**

5.1 Summary.....	45
5.2 Conclusion.....	46
5.3 Recommendation.....	46
Literature Cited.....	48
Appendices.....	63
Curriculum Vitae.....	90

## LIST OF TABLES

Tables	Page
<b>Table 3.1: Sign up.....</b>	<b>29</b>
<b>Table 3.2: Login.....</b>	<b>29</b>
<b>Table 3.3: Add Class.....</b>	<b>30</b>
<b>Table 3.4: Add &amp; Removed Module.....</b>	<b>30</b>
<b>Table 3.5: Add &amp; Removed Students.....</b>	<b>31</b>
<b>Table 3.6: Teachers Login view.....</b>	<b>33</b>
<b>Table 3.7: Teacher's Overview Page.....</b>	<b>34</b>
<b>Table 3.8: Teacher's Class Page.....</b>	<b>35</b>
<b>Table 3.9: Teacher's Module Page.....</b>	<b>36</b>
<b>Figure 3.5: Teachers Login View.....</b>	<b>34</b>
<b>Figure 3.6: Teacher's Overview View.....</b>	<b>35</b>
<b>Figure 3.7: Teacher's Class View.....</b>	<b>36</b>
<b>Figure 3.8: Teacher's Module View.....</b>	<b>37</b>
<b>Figure 4.1: Provide modifications such as adding, saving, and updating the modules and students.....</b>	<b>38</b>
<b>Figure 4.2: Provide a database for the records of all student modules that were released and returned.....</b>	<b>39</b>
<b>Figure 4.3: Generate a list of modules.....</b>	<b>41</b>
<b>Figure 4.4: Generate a list and data of the students.....</b>	<b>42</b>
<b>Figure 4.5: Provide a summary report of all the module list.....</b>	<b>43</b>
<b>Figure 4.6: Provide a numerical report of every student's records.....</b>	<b>44</b>
<b>Figure 4.7: Provide a Barcode for every module.....</b>	<b>44</b>

## LIST OF FIGURES

Figures	Page
Figure 1.1 Conceptual Framework.....	5
Figure2.1: Monitoring Students' Learning.....	17
Figure2.2: Electronic Document System.....	18
Figure2.3: Student Attendance System by Barcode Scan.....	19
Figure2.4: Web-Based Document Tracking and Management System.....	20
Figure2.5: Student Identification Monitoring System using Barcode Scanner.....	21
Figure 3.1: Waterfall Methodology.....	22
Figure 3.2: System Architecture.....	25
Figure 3.3: Use Case Diagram.....	29
Figure 3.4: Entity Relationship Diagram.....	33
Figure 3.5: Teachers Login View.....	34
Figure 3.6: Teacher's Overview View.....	35
Figure 3.7: Teacher's Class View.....	36
Figure 3.8: Teacher's Module View.....	37
Figure 4.1: Provide modifications such as adding, saving, and updating the modules and students.....	39
Figure 4.2: Provide a database for the records of all student modules that were released and returned.....	40
Figure 4.3: Generate a list of modules.....	41
Figure 4.4: Generate a list and data of the students.....	42
Figure 4.5: Provide a summary report of all the module list.....	43
Figure 4.6: Provide a summary report of every student's records.....	43
Figure 4.7: Provide a Barcode for every module.....	44

**LIST OF APPENDICES**

<b>APPENDIX</b>	<b>PAGE</b>
Appendix A: Gantt chart.....	63
Appendix B: Letters.....	64
Appendix C: Grammarly/Certificate.....	65
Appendix D: Evaluation Form (Blank).....	69
Appendix E: User Testing/Evaluation Form (With User Assessment).....	71
Appendix F: User Evaluation Results.....	76
Appendix G: User Testing Photo Documentation.....	78
Appendix H: User Manual.....	80

### Abstract

**Romie Matangcas, Carl Patrick G. Duero, and Shechem D. Dindin.** "Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School." (BSIT Capstone Project). Davao Oriental State University, June 2022.

Adviser: **Wilkin F. Simo**

Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School is a web-based system that aims to help the teachers monitor the students' expected academic records using the barcode scanner. In detail, the project aims to (1) provide modifications such as adding, saving, and updating the records of the modules and students; (2) provide a database for the records of all student module transactions; (3) generate a list of modules; (4) generate a list and data of the students; (5) provide a summary report of all the module list and (6) provide a summary report of all the module list; and (7) Provide a Barcode for every module. The waterfall methodology was utilized in this project. This project was carried out to assist Dawan National High School teachers in monitoring student modules. The disadvantage of having a modular class is that teachers must prepare and keep a large number of printed papers for compilation and recording reasons in conjunction with the release and return of students' modules. Moreover, this system will enable modifications such as adding, storing and updating modules and student information and a database for the records of all student module transactions.

**Keywords:** web base system, waterfall methodology, barcode scanner, database, academic records, and student modules.

modality considers individuals in remote regions who do not have access to the Internet for online learning. Public schools are burdened with time-consuming paperwork and redundant processes, making it difficult to keep track of their data (Sriram, 2019).

Teachers are straining to keep track of the release and return of students' modules because of the lack of internet during the pandemic. On the other hand, having a modular class has the disadvantage of requiring instructors to constantly store a large number of printed papers for compilation and recording reasons in conjunction with the release and returned modules.

The module monitoring system assists teachers in keeping track of how many modules have been released and returned by the students.

## CHAPTER I

### INTRODUCTION

#### 1.1 Rationale

The new coronavirus infection known as COVID-19 occurred at Huanan Seafood Market in Wuhan City, China, in December 2019 (Wikipedia, 2020). It has turned out to be a global health emergency within a couple of months. Most nations have temporarily shuttered educational facilities to slow the spread of the virus and prevent infections. The school's face-to-face involvement of students and teachers has also been suspended. (Tria, 2020). The most common kind of distance learning is modular learning. The Department of Education in the Philippines also opted modular learning model for basic education. The most popular distance learning option among parents with children enrolled this academic year is studying through printed and digital modules. The modular modality considers learners in remote regions who do not have access to the internet for online learning. Public schools are burdened with time-consuming paperwork and manual processes, making it difficult to keep track of their data (Sriram, 2019).

Teachers are straining to keep track of the release and return of students' modules because of the large enrollment during the pandemic. On the other hand, having a modular class has the disadvantage of requiring instructors to construct and securely store a large number of printed papers for compilation and recording reasons in connection with the release and returned modules.

The module monitoring system assists teachers in keeping track of how many modules were issued and returned and how many of those returned were damaged and could not be reused. This monitoring system will make the teacher's work more effortless

than the manual type of updating and keeping track of their students' modules that were released and returned.

### **1.2 Purpose and project Description**

The project entitled "Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School" aims to provide a system that can help teachers in module monitoring and make their jobs easier. It provides features that can assist the users in monitoring the records of the released and returned modules. Also, it can generate students' information as well as their records. All of the data is stored in the database. The users can only access the system given a valid username and password for security and confidentiality purposes.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

The main objective of this project is to develop a system using a database management system that can provide a solution to assist the school, particularly the teachers, in doing more accurately monitoring modules that is practical and valuable to the users. This project aims to keep track of the module records and the students' progress.

#### **1.3.2 Specific Objectives**

1. Develop a web-based system for monitoring modules called "Automation on Monitoring Modules Using Barcode Scanner at Dawan National High School," which can have the capability to:

- provide modifications such as adding, saving, and updating the records of the modules and students;
- provide a database for the records of all student module transactions;
- generate a list of modules;
- generate a list and data of the students;
- provide a summary report of all the module lists;
- provide a summary report of every student record; and
- provide a barcode for every module.

#### **1.4 Significance of the Study**

This project provided a system that can help teachers easily enter and record their weekly module monitoring on time. They may access the data whenever they need it. It can also help students to quickly verify if the modules they take and return are complete, and they can request their records whenever they need them and for; the parents of the students can request a record of their children's records so they can see what their children status in school. And to the future, researchers can use our work as a reference for their database management system-related projects.

#### **1.5 Scope and Limitation**

##### **1.5.1 Scope**

The following are the functions that the proposed system can do:

- the system can add, save and update module information and student information;
- the system can store module records and student records;
- the system can show the list of students and data;
- the system can display a list module that is released and returned;

- the system can generate a barcode for every module;
- the system can print a list of modules;
- the system can print student records;
- the system can import csv files; and
- the system can export csv files.

### 1.5.2 Limitations

The following are the functions that the proposed system cannot do:

- the system cannot add module and student information unless all the information needed is filled up; and
- unauthorized users cannot access the system.

*Monitoring of Modules Using Barcode Scanner at Owen National High School* has researcher's systematic steps from the initial literature review, and synthesis, to make sure all the requirements were met, the appropriate tools were utilized, and the system development process was followed closely. Hence testing of the system was minimized by respondents until they've toward system implementation, and their responses will form the foundation for bug repairs and continued development of the system. *System design, the features, and the functionalities*.

## 1.6 Conceptual Framework

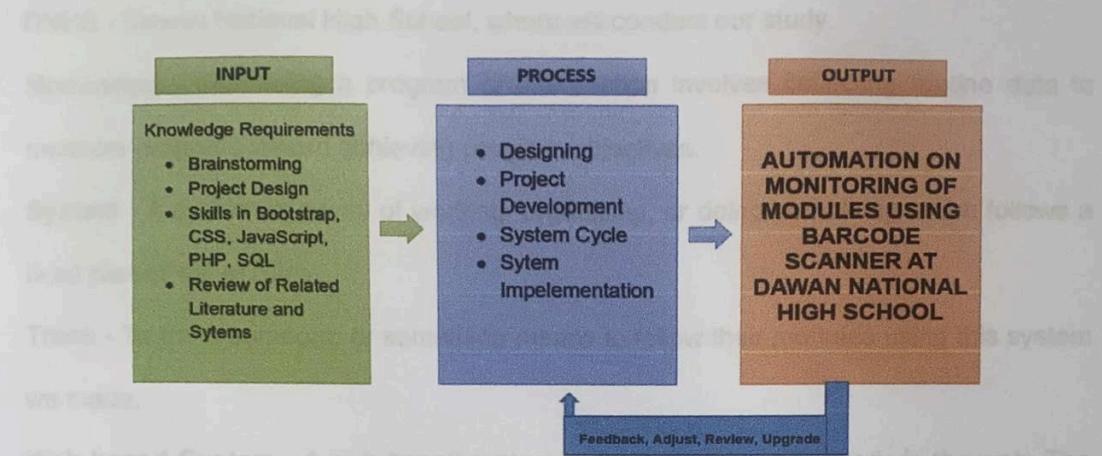


Figure1.1- Conceptual Framework

Shown in Figure1.1 is the Input-Process-Output (IPO) diagram of “Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School” the researcher’s synthesized ideas from the related literature, studies, and systems. To make sure all the requirements were met, the appropriate tools were utilized, and the system development process was followed closely. Phase testing of the system was carried out by responders as it moved toward system implementation, and their comments served as the foundation for bug repairs and continued development of the system in terms of the design, the features, and the functionality.

## 1.7 Definition of Terms

### CHAPTER 8

**DNHS** - Dawan National High School, where we conduct our study.

**Monitoring** - Monitoring a program or intervention involves collecting routine data to measure progress toward achieving program objectives.

**System** - A system is a way of working, organizing, or doing something which follows a fixed plan or set of rules.

**Track** - To track someone or something means to follow their modules using this system we made.

**Web-based System** - A web-based system is an application accessed via the web. The term web-based is usually used to describe applications that run in a web browser.

**CSS** classes and javascript functions used for responsive design and the development of responsive, mobile-first websites and applications. It uses a grid approach to make page layouts with rows and columns, and it works with all browsers to create responsive websites. It resolves numerous issues that we previously encountered, one of which is the cross-browser compatibility issue.

### 2.1.2 CSS (Cascading Style Sheet)

It is a straightforward design language meant to make websites easier to maintain and manage. CSS is the name for a website's appearance and feel. CSS is used to manage the color of the text, font style, paragraph spacing, how columns are styled and laid out, what background pictures or colors are used in web designs, different margins, various borders and hidden lines, and a variety of other effects.

**REVIEW OF RELATED LITERATURE****2.1 Technical Background**

The proponents have used different applications during the development of the system, and these were the following:

**2.1.1 Bootstrap**

The most popular open-source front-end framework is Bootstrap. It was created on August 19, 2011, by Mark Otto and Jacob Thornton. Bootstrap may be a collection of CSS classes and JavaScript functions used for responsive design and the development of responsive, mobile-first websites and applications. It uses a grid approach to make page layouts with rows and columns, and it works with all browsers to create responsive websites. It resolves numerous issues that we previously encountered, one of which is the cross-browser compatibility issue.

**2.1.2 CSS (Cascading Style Sheet)**

It is a straightforward design language meant to make websites attractive and more manageable. CSS is to blame for a website's appearance and feel. CSS is used to manage the color of the text, font style, paragraph spacing, how columns are scaled and laid out, what background pictures or dyes are used, layout designs, display variants for various devices and screen sizes, and a variety of other effects.

### 2.1.3 JavaScript

JavaScript may be a lightweight, object-oriented artificial language that's accustomed write webpages on many websites. It's a full-fledged interpreted programming language. When added to an HTML page, JavaScript enables dynamic interactivity on websites. It allows users to make advanced web applications with which they will interact without reloading the page anytime.

The DOM API frequently uses JavaScript to change HTML and CSS to update a computer program dynamically. It is most typically found in online applications.

### 2.1.4 PHP

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a popular open-source general-purpose scripting language ideal for web development and can be integrated into HTML.

### 2.1.5 SQL

SQL is a domain-specific language used in programming and designed for managing data held in a relational database management system or for stream processing in a relational data stream management system.

### 2.1.6 Barcode to PC

By delivering real-time strokes to a personal computer (PC), Barcode to PC transforms a smartphone into an accurate barcode scanner.

## 2.2 Review Related Literature

This group presents the related studies gathered by the researcher, which are taken from books, the internet, and other resources. The expansion of the internet and accessibility has led to an increase in the demand for online learning worldwide. Online learning attracts more students for better learning experiences. But many of them encounter challenges that can cause hindrance to their knowledge. The benefits are getting suppressed by the difficulties during their learning process as these are the existing related studies associated with this study.

### 2.2.1 Modular Learning System

Tercan (2018) mentioned in his study to attempt to examine the modular EFL system of the Foreign Language Preparatory Class at a private university in Izmir and find out the perceptions of instructors and university students of preparatory classes regarding this system. In addition, this study aims to detect whether the perceptions of students and instructors match the program features. A mixed-method of the qualitative and quantitative design was employed in the study. A questionnaire was administered to 132 students, and an interview was conducted with five instructors to determine the program's value. The study used two primary data sources: instructors and students. The quantitative data collected through a questionnaire was analyzed by using descriptive statistics. However, the qualitative data was examined through content analysis. The program evaluation results indicated that although there are some shortcomings of the modular system, it could be continued by modifying the program to produce the desired learning outcomes according to the needs of students.

Students do not do their modules wholeheartedly because some copy others' answers without reading what is in the modules. Students now are different and changed the way they answer their tasks. Unlike those days when the class was face to face and students could perform in their classes.

Chin (2020) cited that after the opening of classes, these problems and difficulties encountered by students, especially teachers, burst into different social media platforms.

### **2.2.2 Technical Element**

The most substantial issue in distance learning is the learning management system. Technicality involves the availability of devices for students and teachers, such as mobile phones, computers, laptops, printers, and internet connections.

1. Self-Learning Module's Reliability – this new norm's pivotal instrument, its content should meet the standard learning capacity. These instructional materials will be assessed by students on their own mostly.
2. Sense of Authority– as mentioned, the luxury of being less pressured. Parents become teachers but do not see to be as one.
3. Focus and Concentration -refer to the comfort of studying at home with more minor or no supervision. Students tend to divert their attention instead of focusing on and prioritizing their homeschooling first.
4. Parent's / Guardian's Educational Background- it may sound off but let's face the reality that not all parents are well equipped with proper education.

### 2.2.3 Students

In addition, Chin (2020) mentioned findings of this research contribute to the existing knowledge through new insights into determining students' engagement in online courses that follow an activity-based learning design approach. Learning dispositions, such as the reported engagement, perceived satisfaction, and student feedback elements, could be generous dimensions to add to a learning design ecosystem to improve student learning experiences to move toward a competency and outcomes-based learning model. This type of modality has three categories, wherein one of the highly convenient for most the typical Filipino students is Modular Distance Learning. It was also the most preferred learning system of most parents/guardians based on the Learning Enrollment and Survey Form (LESF) result. The Department of Education will be the one to provide and distribute the self-learning modules to every student every week through their respective schools. They will have ample time to study and assess the modules before starting the weekly class.

Students find it challenging to adapt to an online learning environment immediately after traditional classroom learning. Due to the sudden change, they cannot adjust to computer-based learning. Students who have always been studying in the conventional classroom mindset cannot focus on online platforms. They need to accept the new learning environment with an open mind. The research aimed to investigate the relationships between students' reported engagement, satisfaction levels, and overall performances in an online module offered to students (Science, Engineering, Agriculture, Humanities, and Management). The findings of this research contribute to the existing knowledge through new insights into determining students' engagement in online courses that follow an activity-based learning design approach. The world is going through tough

Times with the Covid-19 pandemic. Inevitably, there have been severe impacts on education systems around the globe. Schools and universities were closed, and millions of kids, adolescents, and young adults were out of schools and universities (Nichols, 2003).

The relationship between student-teacher interactions and learning outcomes has been well documented in traditional classrooms (Madden & Carli 1981; Powers & Rossman 1985). Of particular importance in face-to-face classrooms are teacher immediacy and immediacy behaviors. 'Immediacy' refers to the 'psychological distance between communicators' (Weiner & Mehrabian 1968). Educational researchers have found that teachers' verbal and nonverbal immediacy behaviors can lessen the psychological distance between themselves and their students, leading (directly or indirectly, depending on the study) to greater learning (Kelley & Gorham 1988; Gorham 1988; Christophe 1990; Rodriguez, Plax & Kearney 1996). It stands to reason that interactions with instructors would be equally important online. This learning event has led certain researchers to suggest that asynchronous media, because they support fewer effective communication channels, are less capable of representing participants' 'social presence' in online courses (Short, Williams & Christie 1976). However, researchers experienced with online teaching and learning contest this view, arguing that rather than being impersonal, computer-mediated communication often seems to be 'hyper-personal' (Walther 1994).

#### 2.2.4 Teacher

The school Year 2020 -2021 ushered in the beginning of the so-called “Education in the New Normal.” The sudden shift from face-to-face learning to distance learning threatened the parents and students and, most significantly, the Department of Education on what they can do to ensure that though the delivery of learning changes, the quality of the education remains the same. The study was qualitative and conducted to explain the lived experiences of Master Teachers in Monitoring Modular Distance Learning Teachers. Specifically, this aimed to discuss the experiences and challenges encountered by the master teachers in monitoring MDL as part of the “New Normal.” Purposive sampling was used in selecting five master teachers that participated in the study. The researcher used FGD (Focal Group Discussion) and semi-structured interviews to seek in-depth information that revealed the current situation on how the informants responded to the newly implemented way of monitoring modular distance learning modality teachers. Thematic data analysis was utilized to analyze and interpret the results of this study. Findings from the survey showed themes based on the experience of Master teachers in monitoring MDL teachers (Espineli, 2021).

Teachers in the modular assessment system appreciated the better planning opportunity around the exams and the clarity of the focus of their teaching requirements. They felt that modular assessment contributed to their approach to the evaluation for learning. They also appreciated not having to re-motivate students at the end of the year. Teachers in the linear route enjoyed having more space and control to deliver the content effectively; furthermore, they did not find it a burden to revisit topics and re-motivate students before the end-of-year examination (Zhuraeva, 2020).

This descriptive paper aimed to explore and synthesize literature related to understanding modular learning and how it can be implemented effectively so faculty members embrace its use. An in-depth review of literature addressed educational theories supporting modular learning, the development of modular learning, and innovations in education and technology. Researchers analyzed language patterns used in the literature to develop a common language for and understand the concept. Analysis and recommendations and a proposed definition of modular learning are included (Jill, Carol & Craig, 2014).

### **2.2.5 Modular Learning System amidst Pandemic**

The threat brought about by Corona Virus or COVID-19 had made an enormous impact not only on the economic, tourism, and health sectors, but it also hardly hit the education system of the world at large. Specifically, this pandemic crisis had caused the Philippine higher education institutions to abruptly shift to emergency remote teaching (ERT) as a response to the call for continued education despite the global health threat. The paper discussed the lived experiences of five learners suddenly immersed in a remote learning context amidst the danger of COVID-19. This study revealed four themes: poor to no internet access, financial constraints, lack of technological devices, and affective or emotional support. Interestingly, findings showed that learning remotely in these trying times is challenging. Aside from the existing problems on access and affordability, the emerging financial stability and affective support concerns contributed to interrupting learning engagement. Moreover, exposing culturally face-to-face learners in the context of ERT can put additional learning pressure. Nevertheless, the need to listen to the students' lived experiences in ERT will provide a lending ear to be heard and a voice for building a pedagogy of understanding about their learning journey in this time of pandemic crisis (Alvarez, 2020).

The COVID-19 pandemic has had a significant impact on everyday life. Teaching and learning at all levels have also been affected, including clinical instruction in medical schools. Direct patient interaction is complicated, especially in groups, outpatient departments, or wards. Also, patients have reduced visits for non-emergency reasons. Institutes have adapted to the changed circumstances by increasing the use of online learning. Online education has its limitations, especially in medical education, more so in the context of clinical rotations. Dermatology, an inherently visual speciality, is probably more amenable to online learning than other specialities (Wadani, 2020).

The COVID-19 pandemic has affected education, and teacher education in particular, in various ways. As a result of the closure of universities and schools, teachers and students had to adapt to remote teaching rapidly. Teacher education is no exception. In need to create learning environments for students, teachers are making implied decisions, choices, and adaptations to meet the expectations of students and the requirements of teacher education, and the conditions in which both universities and schools have to operate (Flores & Gago 2020).

## 2.2.6 Barcoding

Gonzaga (2013) explained that the supervision system was cumbersome to detect the student's location, and it was a very tedious task to take attendance manually. As technology has advanced, integrating the monitoring system with automation technology will provide more convenient monitoring of the student. The Radio Frequency Identification (RFID) technology is one of the automation technology that is beneficial in improving the current traditional way of monitoring students. As every tag has its unique ID, it is easy to differentiate every tag holder. In addition, a Graphical User Interface (GUI) provides a more efficient way to review attendance. Thus, integrating RFID technology and the GUI

in an attendance system will produce an automatic system with better performance and efficiency than the traditional monitoring method. It is a well-known truth that for efficient operation, planning, and management of the organization, almost all companies, whether commercial or educational, must maintain an accurate record of the attendance of their employees or students. The majority of educational institutions in underdeveloped nations take attendance manually using paper logs and the antiquated method of calling pupils by name in a file system. It becomes difficult for the management to manually determine the proportion of classes attended for exams and subsequent results processing, according to (Tabassam et al., 2009). Particularly in Nigerian institutions, the state of inadequate attendance record-keeping has deteriorated to a higher degree (Saheed, 2016).

### 2.3 Review-Related System

#### 2.3.1 Monitoring Students' Learning System (EDTS)

The student body of educational research literature, which has come to be known as effective schooling research, identifies the practice of monitoring student learning as an essential component of high-quality education. The careful monitoring of student progress is shown in the literature as one of the significant factors differentiating effective schools and teachers from ineffective ones. Indeed, those analyses which have sought to determine the relative effect sizes of different instructional practices have identified monitoring student progress as a strong predictor of student achievement (Cotton, n.d.)

The students accurately as the instructor might be too busy handling stuff or overlooked. To do with the problem mentioned above, the study to the potential of using IoT framework to automate classroom monitoring activity. As the preliminary work in this paper, the researchers mainly focus on the data analysis module integrating computer

vision technologies and machine learning algorithms to perform attendance taking understanding students' motion, and students' behavior analysis with minimum human intervention. The camera captures the classroom scene and feeds it to the connected processing unit to acquire the input for further analysis, such as face detection, motion analysis, and behavior understanding (Lim, 2017).



*Figure 2.1: Monitoring Students' Learning*

### **2.3.2 Electronic Document Tracking System (EDTS)**

This project is aimed to develop Electronic Document Tracking System through the web for the Faculty of Office Management and Technology. The project is becoming more crucial as the university utilizes a paperless society to help staff significantly.

This project explores the scope and importance of EDTS in detail and illustrates how it expands our view of information management. It is designed to help structure the field by approaching it from three perspectives: making technologies.

EDTS possible, the application areas in which business value is being realized, and the roles and responsibilities of personnel that will be involved in maintaining EDT. The project suggests what administrators can do now to prepare for this significant advancement in information management (Zulkifli, 2009).

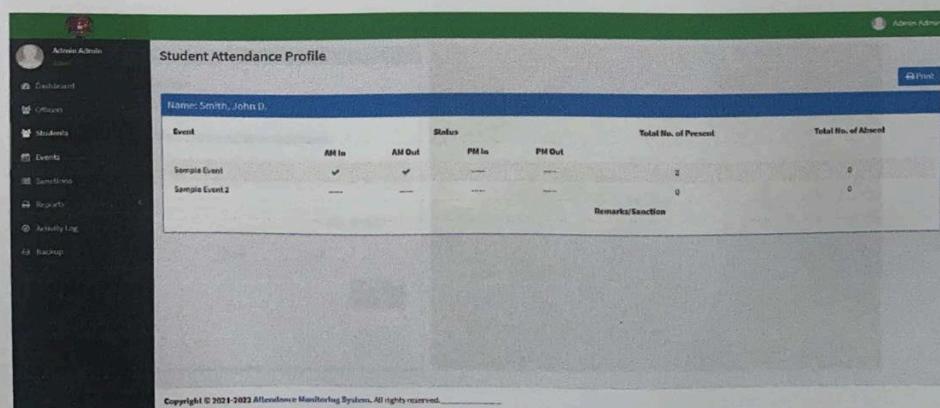


and be in charge of keeping an eye on the kids' progress while they are charged with overseeing what

*Figure 2.2: Electronic Document System*

### 2.3.3 Student Attendance System by Barcode Scan

The project is a barcode-based system for recording student attendance. Each student receives a card with a special barcode on it. Each barcode is a unique way for the student to be identified. The technology records the students' attendance according to dates once they scan their ID cards using a barcode scanner. The system then creates a defaulter list and keeps all of the student's attendance records. Additionally, it creates a thorough report for administration in an excel sheet. For everyday attendance, such an application is useful in both school and college.



*Figure 2.3: Student Attendance System by Barcode Scan*

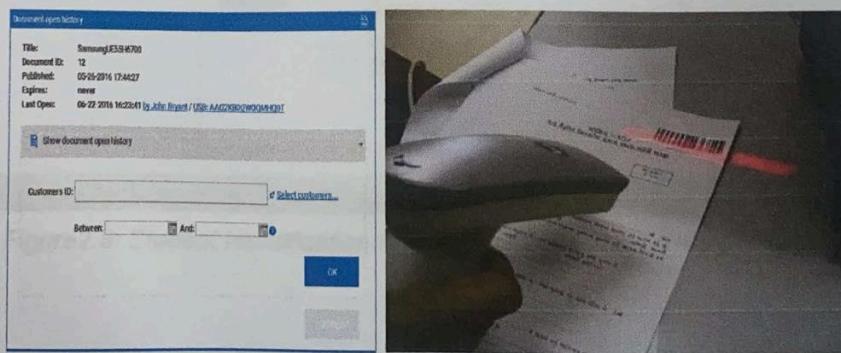
#### *2.3.3 Student Identification Monitoring System using Barcode*

#### **2.3.4 School Event Attendance Monitoring System with Barcode Scanning using PHP**

This system intends to streamline the procedure for verifying students' attendance and keeping track of their participation in all school-related activities. The list of students, officers, and events is stored by the system. The officers will have access to the system and be in charge of keeping an eye on the kids' presence at the event they are charged with overseeing. When a can officer verifies attendance and displays the results, the source code is very specific.

#### **2.3.5 Based Document Tracking and Management System**

The study focused on developing a web-based document tracking and management system that would ease handling, securing, and tracking the documents in the Department of Public Works and Highways (DPWH) Laguna II District Engineering Office. It would help the said department keep track of their records, store the data, and easily retrieve documents. The client/sender could also submit their request using the system (Pascual, 2016).



*Figure 2.4: Web-Based Document Tracking and Management System*

### 2.3.6 Student Identification Monitoring System Using Barcode

In many institutions and organizations, particularly schools, monitoring students is a significant factor, especially in identifying every individual coming in and out of the school every day. School is considered a second home. Students, teachers, and employees spend most of their time in school. Crimes increase every day as the school is one of the places where most of the crimes occur. Crimes happen because schools do not put much effort into security. Most schools feel secure by placing a security guard at the main entrance. Safety is at risk because, in many cases, outsiders who were not students or enrolled in the school bypass guards and personnel assigned and manage to make a way of going inside the school. In other cases, even other students do not follow regulations and policies like wearing proper uniforms and IDs upon entering. They can also enter the school without wearing it, or sometimes if they forget to bring their own ID card, they try to borrow other students' identification cards.

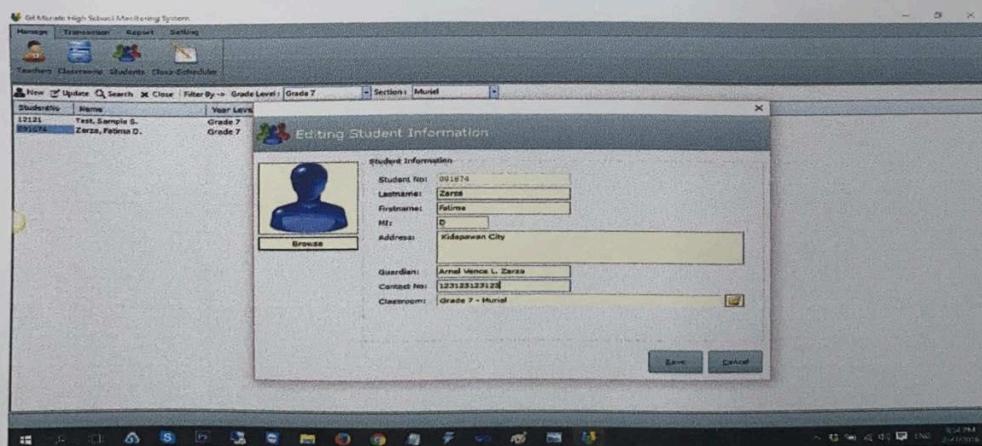


Figure2.5: Student Identification Monitoring System using Barcode Scanner

## 2.4 Synthesis

### CHAPTER II

#### MATERIALS AND METHODS

Based on the research mentioned above, which is related to this proposed project, there are many ways to develop a system based on the need of the people. Also, there are a lot of factors to consider in creating the web system. The proponents learned that many approaches could help the teachers provide their modules easy and quick to make grades and monitor each student learning about each subject.

From the concepts mentioned above, this Monitoring System provides the insurance for the student's learning and helps the teachers monitor their students by using a barcode to track their modules. Among other related systems, Monitoring Student Learning is one of the systems closest to our project related to monitoring the students. It has similar objectives as the proposed project, which is to help the teachers monitor their students even if they are learning at home

Figure 3-1. *Waterfall Methodology*

## CHAPTER III

### MATERIALS AND METHODS

#### 3.1 Software Methodology

The methodology for software development is considered a structure to contribute to the clear understanding of the study wherein the researchers have noticed the need for accurate and easy-to-use reference material for AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL. Planning and controlling the procedure of creating a specialized information system. In this study, the proponents conducted a series of researches and observations in different settings, as shown below.

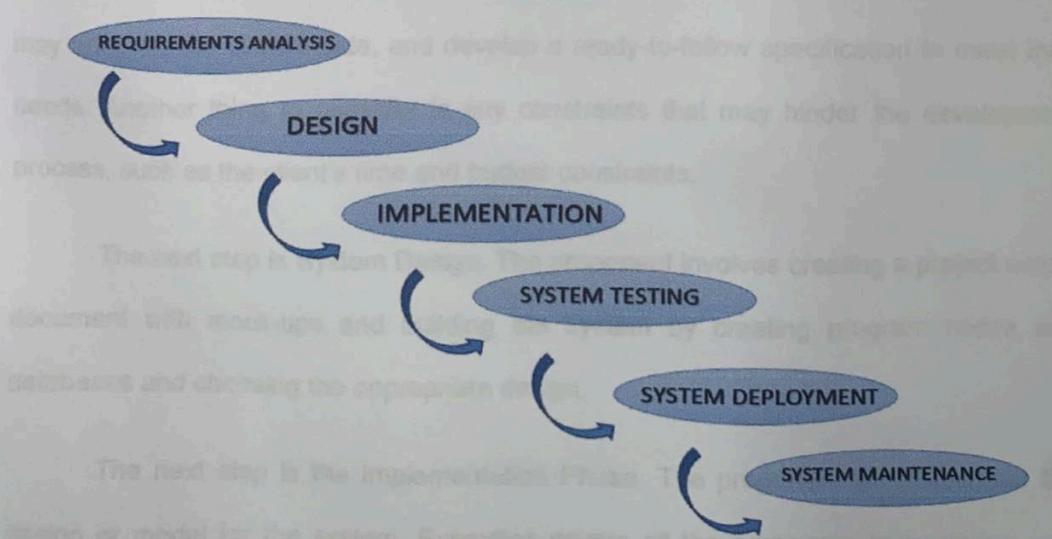


Figure 3.1: Waterfall Methodology

In developing the proposed system, the proponents used the Waterfall Methodology to create the system, and this process would serve as a guiding principle in getting the design done. In a Waterfall Methodology, it is straightforward to understand and use. Each phase must be completed before the next step can start. At the end of each stage, a review takes place to determine if the project is on the right path and whether or not the project should be continued. Phases must not overlap with each other. In the Waterfall model, there will be no customer involvement; only at the beginning of the project, the customer is involved. After the project is completed, the project is given to the customer; until then, there will be no customer involvement until then.

The proponent started with Requirement Gathering and Analysis. At this phase, it is essential to document all the requirements for the desired software, and it should allocate sufficient time, especially in conducting extensive interviews with stakeholders. It is better to arrange all incoming data, analyze them, consider all technical limitations that may arise on the client's side, and develop a ready-to-follow specification to meet their needs. Another thing to consider is any constraints that may hinder the development process, such as the client's time and budget constraints.

The next step is System Design. The proponent involves creating a project scope document with mock-ups and building the system by creating program codes and databases and choosing the appropriate design.

The next step is the Implementation Phase. The proponent will implement the design or model for the system. Execution covers all the processes in operating new software correctly, including installing and running the system. So in this step, the system is already developed and installed. The researchers will be using Google's Map API to provide a reliable and precise map of the public user's location.

After that is Testing Phase; at this phase, the proponent will undergo a test to check the functionality of the whole design and its construction. If there are any errors, they will surface at this point in the process. The researchers will gather public users to test the system to try and see the system's status.

Lastly is the Releasing Phase; once the proponents are done running, testing, and implementing the system, it will be released and introduced to the clients or end-users as a finished product.

### **3.2 Requirements Analysis**

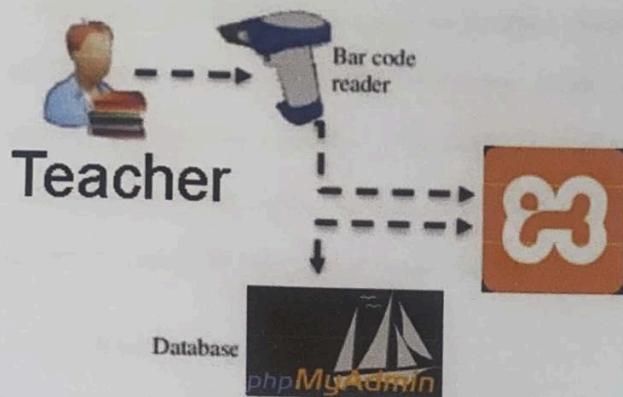
#### **3.2.1 Documentation of the Current System**

Teachers are straining to keep track of the release and return of students' modules because of the large enrollment during the pandemic. On the other hand, having a modular class has the disadvantage of requiring instructors to construct and securely store a large number of printed papers for compilation and recording reasons in connection with the release and returned modules.

#### **3.2.2 Requirements Specification**

The project is a web-based automation module system that intends to help all Davao National High School teachers. It will serve to automate the current process of releasing modules to the students, and also, there will be a requirement analysis for each class, module, and student. So that the teacher can easily access and use the data required and organized required.

### 3.3 System Architecture



*Figure 3.2: Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School” System Architecture*

This figure shows the flow of the proposed system that the teacher will be using a bar code reader in part of releasing modules. Xampp is used to be the central controller of the website; also, the PHPMyAdmin will be used as the backend where all of the records and released modules will store.

#### 3.3.2 Requirements Specification

The project is a web-based automation module system that intends to help all Dawan National High School teachers. It will serve to automate the current process of releasing modules to the students, and also, there will be a centralized database for each class, module, and student. So that the teacher can easily access all the data required and reports needed.

### 3.3.2.1 System Perspective

The project is a web-based automation module system that intends to help all Dawan National High School teachers. It will serve to automate the current process of releasing modules to the students, and also, there will be a centralized database for each class, module, and student. So that the teacher can easily access all the data required and reports needed.

### 3.3.2.2 System Features

The researchers provided different product features for teachers to interact while using the website and be able for the system to function according to its objectives.

#### 3.3.2.2.1 Web Application

This feature can be used as a user interface, as it provides interactions with the user. It serves as the primary user interface of the project, as a modern society now has Laptop/desktop devices that are easy to use as well.

### 3.3.2.3 User Classes and Characteristics

The users of this project are the teachers who are having a hard time organizing students' data and releasing modules.

### 3.3.2.4 Operating Environment

The researchers used platforms and technologies in developing the project.

#### **3.3.2.4.1 Software Components**

Developing the website makes it more convenient for the developers to apply JavaScript in designing the website's front-end interface. The developers also used PHP/ CSS to make the website interactive and responsive and accomplish goals. MySQL database is used to store and retrieve data.

#### **3.3.2.5 Design and Implementation Constraints**

Some software has limitations and constraints that prevent and forbid the application from processing the work not included in its functionality. It is only applicable on any brand for desktop or laptop as long as it has at least Pentium 4 Processor and two GB of Ram to run the program smoothly.

#### **3.3.2.6 User Documentation**

The developers have provided a user manual of the website to help the users understand and be guided on operating the system.

#### **3.3.2.7 Other non-functional requirements**

The developers have provided different requirements to ensure the website satisfies the functionalities intended for its scope.

##### **3.3.2.7.1 Safety Requirements**

The system's developers ensured that no potentially harmful or questionable substances were included in the devices. The database's confidential data is kept safe.

### 3.3.2.7.2 Security Requirements

Before the modules were run through for testing, the developers ensured that the system did not consist of any unsafe or risky content that might lead the users to have false information and meet all the desires wanted. Scanned modules automatically are included in the list of modules accredited by the school.

### 3.3.2.7.3 Software Quality Attributes

The AUTOMATION ON MONITORING MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL has software quality attributes:

#### 3.3.2.7.3.1 Reliability

The developers ensured that the system would not crash when performing the programmed functions. Before releasing the system, the researchers thoroughly tested it. The system was tested to see if it had all of the necessary features. The plan was further tested with the support of the specific user for any problems to assure reliability.

#### 3.3.2.7.3.2 Efficiency

The developers looked at various sources to ensure the system's efficiency when designing the projects.

Figure 3.3: Use Case Diagram for Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School

### Figure 3.3 Usability 3.3.2.7.3.3 Usability AUTOMATION ON MONITORING

The developers have provided images and labels to

quickly obtain information about the system,

"AUTOMATION ON MONITORING OF MODULES USING

BARCODE SCANNER AT DAWAN NATIONAL HIGH

SCHOOL" assured the system's usability.

## 3.4 Design

### 3.4.1 Use Case Diagram

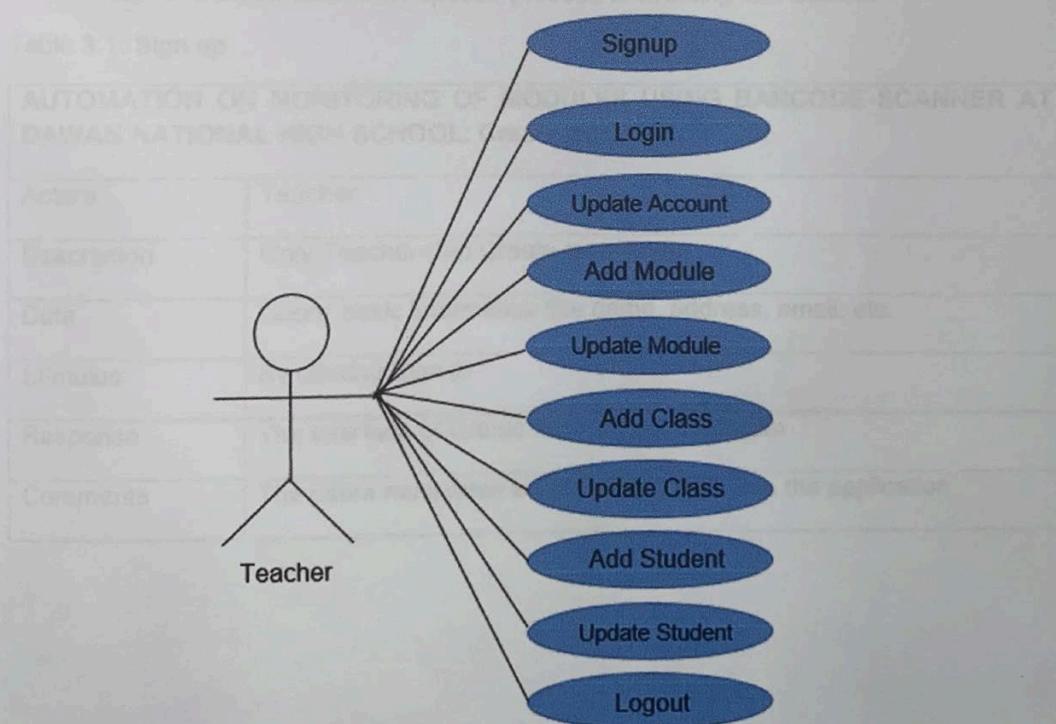


Figure 3.3: Use Case Diagram for Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School

Figure 3.3 showed the use case diagram for AUTOMATION ON MONITORING MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL.

It defined the scope of the system that provided the user to create an account and log in features wherein all teachers must sign up first to gain access to the system.

### 3.4.1.1 Use Case Descriptions

This showed the descriptions of the Use Case Diagram that the developers were using.

#### 3.4.1.1.1 Sign up

The table below shows the specific process of Creating an Account:

Table 3.1: Sign up

<b>AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL: Create Account</b>	
Actors	Teacher
Description	Only Teacher Can Create an account
Data	Users' basic information like name, address, email, etc.
Stimulus	By clicking Sign-in
Response	The interface of Create account will be shown
Comments	The users must have an account to login into the application

### 3.4.1.1.2 Login

The table below shows the specific process in login:

Table 3.2: Login

<b>AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL: Login</b>	
Actors	Teacher
Description	user can log in to an account
Data	Users' basic information like name, address, email, etc.
Stimulus	By clicking login
Response	The interface of Create account will be shown
Comments	The users must have an account to login into the application

### 3.4.1.1.3 Add Class

The table below shows the specific process on how to add classes:

Table 3.3: Add Class

<b>AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL: Add Class</b>	
Actors	Teacher
Description	The user can add/please a Class according to their needs
Data	Information of the class like name, class ID, etc.
Stimulus	Clicked by the type of teacher
Response	It will be shown once it done
Comments	To check whether the class has already existed or not

#### 3.4.1.1.4 Add & Remove Module

The table below shows the specific process on how to add and removing module

Table 3.4: Add & Remove Module

<b>AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL: Add &amp; Remove Module</b>	
Actors	Teacher
Description	The teacher can add the module to be viewed by the user and also can remove a module
Data	Information about the module like name, description, etc.
Stimulus	Clicked by the type of users
Response	It will be shown once it done
Comments	The teacher must add a module to be shown in the module list and remove a Module based on its category.

#### 3.4.1.1.5 Add & Remove Students

The table below shows the specific process on how to add and removing students

Table 3.5: Add & Removed Students

<b>AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL: Add &amp; Remove Students</b>	
Actors	Teacher
Description	The teacher can add Students to be viewed by the user and also can remove a module
Data	Information about the Students like name, age, gender, etc.
Stimulus	Clicked by the type of users
Response	It will be shown once it done
Comments	The teacher must add students.

### 3.4.2 Entity Relationship Diagram

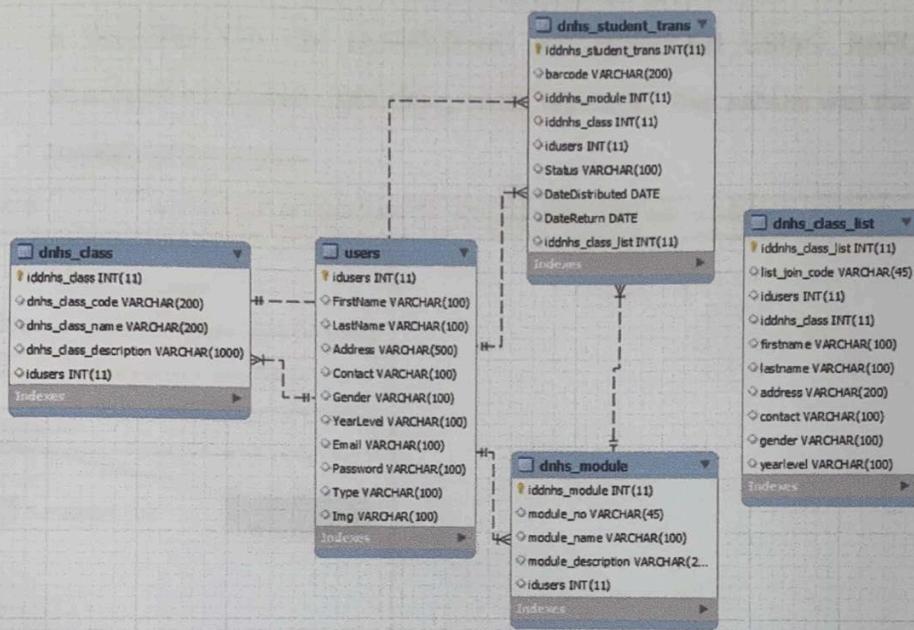


Figure 3.4: Entity Relationship Diagram for Automation on Monitoring of Modules Using Barcode Scanner at Dawan National High School

Figure 3.4 showed AUTOMATION's Entity-Relationship Diagram (ERD) ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL. These diagrams were composed of tables that indicated the database structure to be easier to know the flow of retrieving and sending data from the website to the database.

### 3.4.3 Graphic User Interface (GUI) Design

This would show the possible mock-up design planned by the developers for the system to be developed.

### 3.4.3.1 Website GUI Design

The images below were the Mock-up design intended for the website used in AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER AT DAWAN NATIONAL HIGH SCHOOL. This website was the main interface of the system.

AUTOMATION ON MONITORING OF MODULES USING BARCODE SCANNER

Login

Username

Password

Remember me

Sign in

Figure 3.5: Teachers' Login View

Table 3.6: Teachers' Login view

No.	UI Components	Name	Description
1.	Textboxes	User Credential	Allows teachers to input user credential
2.	Button	Sign in	Allows teachers to sign in to the system

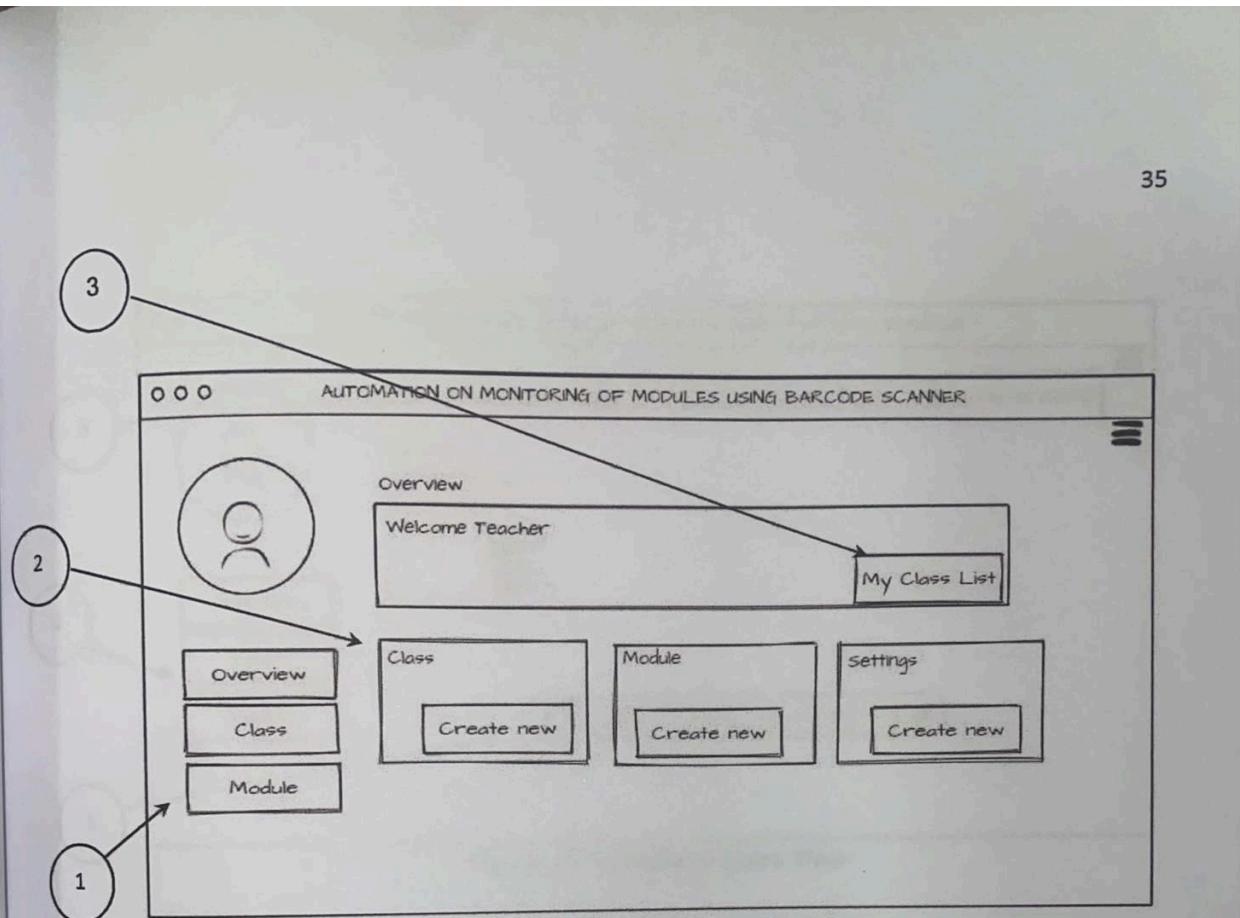


Figure 3.6: Teacher's Overview View

Table 3.7: Teacher's Overview Page

No.	UI Components	Name	Description
1.	Buttons	Side Bar	Allow teachers to navigate the three main functions of the system
2.	Button	Create Class	The teacher can create a class.
3.	Button	Class list button	Allows teachers to go to their class

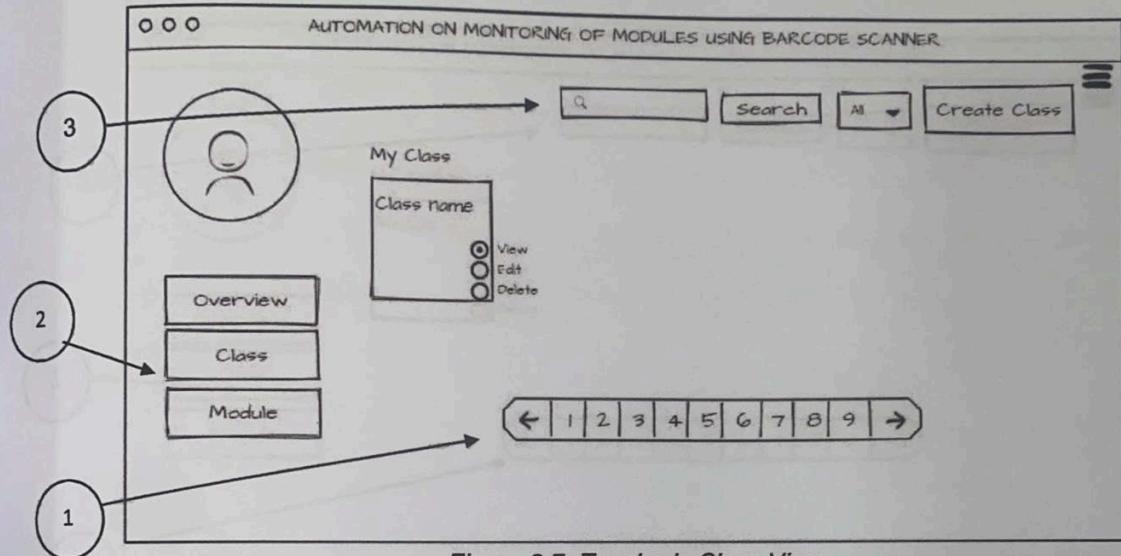


Figure 3.7: Teacher's Class View

Figure 3.8: Teacher's Module Page

Table 3.8: Teacher's Class Page

No.	UI Components	Name	Description
1.	Button	Pagination	Allows teachers to switch pages
2.	Button	Side Bar	The teacher can return to the previous page or continue to the next page.
3.	Button	Search Button	Allows users to search

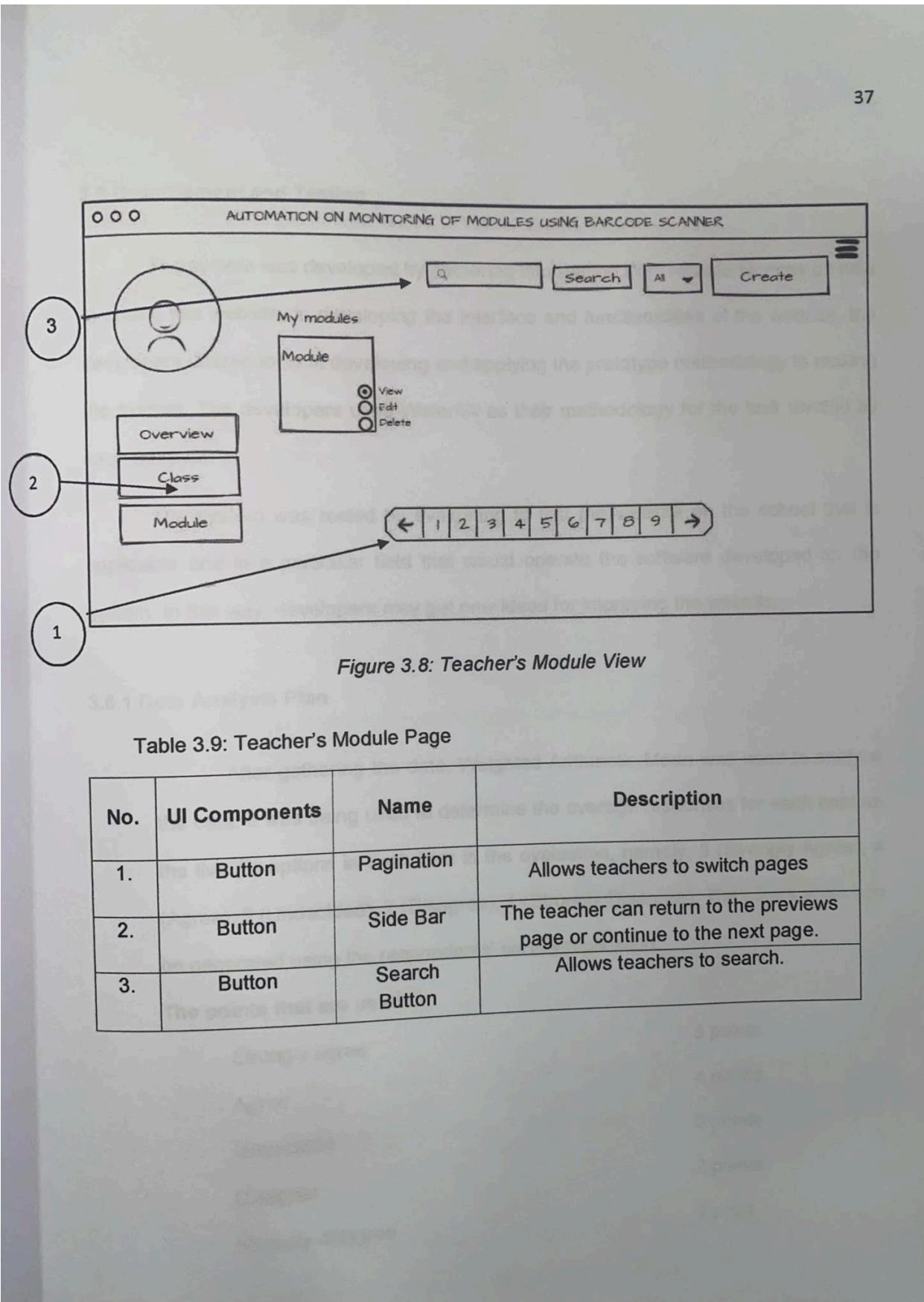


Figure 3.8: Teacher's Module View

Table 3.9: Teacher's Module Page

No.	UI Components	Name	Description
1.	Button	Pagination	Allows teachers to switch pages
2.	Button	Side Bar	The teacher can return to the previous page or continue to the next page.
3.	Button	Search Button	Allows teachers to search.

### 3.5 Development and Testing

The system was developed by gathering information from reliable sources on how to create this website; in developing the interface and functionalities of the website, the developers utilized tools in developing and applying the prototype methodology to making the system. The developers used Waterfall as their methodology for the task divided by each member.

The system was tested by evaluating to test the website on the school that is applicable and in a particular field that would operate the software developed for the system. In this way, developers may get new ideas for improving the website.

#### 3.5.1 Data Analysis Plan

After gathering the data, Weighted Arithmetic Mean was used to analyze the data. It was being used to determine the average responses for each item on the five (5) options in each item in the evaluation, namely, 5 (Strongly Agree), 4 (Agree), 3 (Undecided), 2 (Disagree), 1 (Strongly Disagree). The Likers scale can be generated using the respondents' survey replication.

**The points that are used:**

Strongly agree	5 points
Agree	4 points
Undecided	3 points
Disagree	2 points
Strongly disagree	1 point

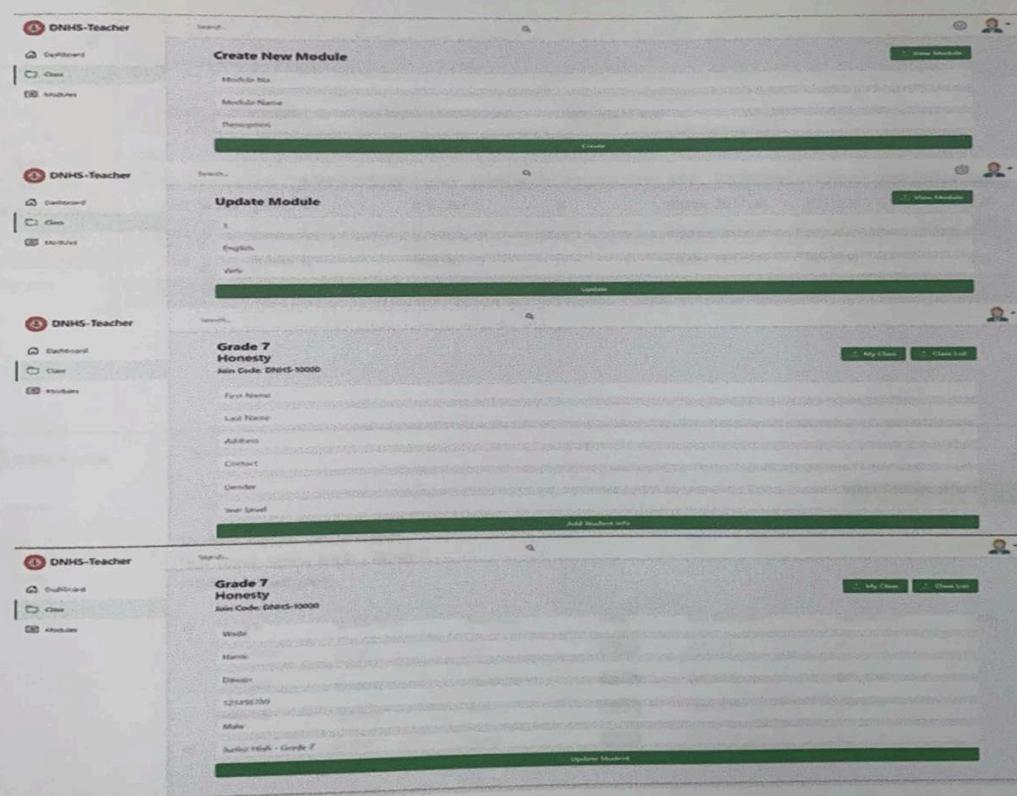
## CHAPTER IV

### RESULT AND DISCUSSION

#### 4.1 Achievement per Objective

##### 4.1.1 Development of the System

###### 4.1.1.1 Provide modifications such as adding, saving and updating the modules and students



*Figure 4. 1: Provide modifications such as adding, saving, and updating the modules and students.*

Figure 4.1 shows that the developers achieved the first objective of the system, which users can add, save and update the information of the modules and

students. For example, creating a new student, the users need to fill in the required information like the first name, last name, address, contact, gender, and year level. The above figure displayed the result of the project objectives.

#### 4.1.1.2 Provide a database for the records of all student module transactions

	iddnhs_student_trans	barcode	iddnhs_module	iddnhs_class	idusers	Status	DateDistributed	DateReturn	iddnhs_class_list	scores
<input type="checkbox"/>	Edit	Copy	Delete	49	MNO-1000	11	14	9	Returned	2021-12-15
<input type="checkbox"/>	Edit	Copy	Delete	50	MNO-1001	12	14	9	Returned	2021-12-15
<input type="checkbox"/>	Edit	Copy	Delete	51	MNO-1002	13	14	9	Returned	2021-12-15
<input type="checkbox"/>	Edit	Copy	Delete	52	MNO-1003	14	14	9	Returned	2021-12-15

ID	Barcode	Module Name	Description	Status	Date Distributed	Date Returned	Scores
49	MNO-1000	(1) English	Verb	Returned	2021-12-15	2021-12-16	
50	MNO-1001	(2) Filipino	Wikang Filipino	Returned	2021-12-15	2021-12-16	
51	MNO-1002	(3) Science	Veins	Returned	2021-12-15	2021-12-16	
52	MNO-1003	(4) Math	Algebra	Returned	2021-12-15	2021-12-16	

Figure 4. 2: Provide a database for the records of all student modules that were released and returned.

Figure 4.2 shows that the developers achieved the second objective of the system, which was developed to provide a database for the records of all student module

transactions. The above figure displayed is the result of the project objectives which users can see the transactions of the student modules.

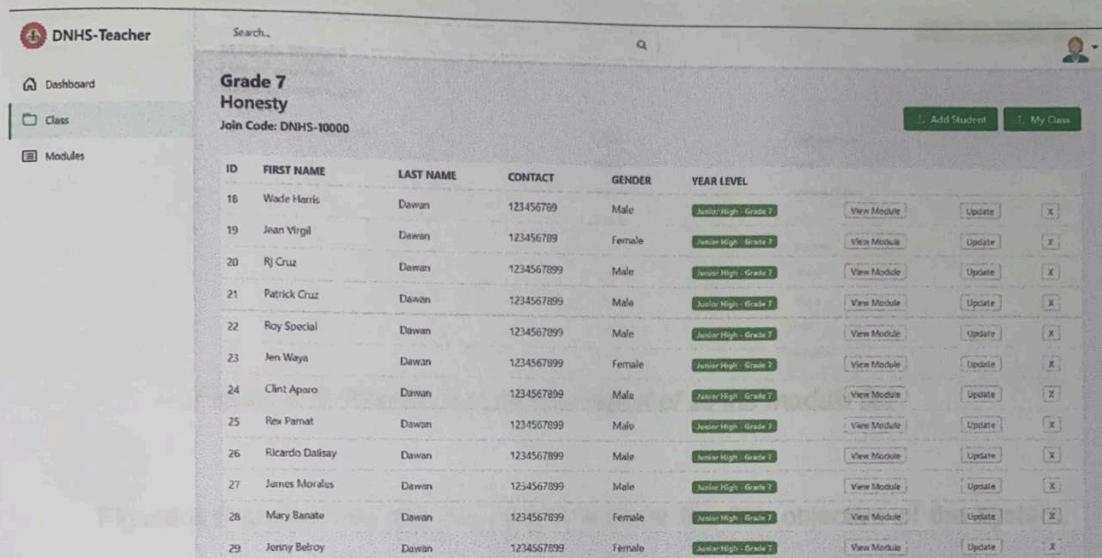
#### 4.1.1.3 Generate a list of modules

Subject	Title	Teacher	Status
English	Info Verb Module No. 1	Teacher: Rommel Matangcas	NEW
Filipino	Info Wikang Filipino Module No. 2	Teacher: Rommel Matangcas	NEW
Science	Info Vira Module No. 3	Teacher: Rommel Matangcas	NEW
Math	Info Algebra Module No. 4	Teacher: Rommel Matangcas	NEW
English 2	Info Nox Module No. 2	Teacher: Rommel Matangcas	NEW
Filipino 2	Info Mapa Module No. 1	Teacher: Rommel Matangcas	NEW
Science 2	Info Cell Module No. 1	Teacher: Rommel Matangcas	NEW
Math 2	Info Equation Module No. 2	Teacher: Rommel Matangcas	NEW

*Figure 4. 3: Generate a list of modules*

Figure 4.3 shows that the developers successfully achieved the third objective of the system, which can generate a list of modules that have already been added to the system. Users can see the added module and edit and delete a module. The above figure displayed the result of the project objectives.

#### 4.1.1.4 Generate a list and data of the students



The screenshot shows a user interface for managing student data. On the left, there's a sidebar with icons for Dashboard, Class (selected), and Modules. The main area has a header 'Grade 7 Honesty' and a sub-header 'Join Code: DNHS-10000'. A search bar is at the top right. Below is a table with columns: ID, FIRST NAME, LAST NAME, CONTACT, GENDER, and YEAR LEVEL. Each row contains a student's information, including their ID, name, contact number, gender, year level (all listed as 'Junior High - Grade 7'), and three buttons: 'View Module', 'Update', and a delete icon ('X').

ID	FIRST NAME	LAST NAME	CONTACT	GENDER	YEAR LEVEL		
18	Wade Harris	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
19	Jean Virgil	Dawan	1234567899	Female	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
20	RJ Cruz	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
21	Patrick Cruz	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
22	Roy Special	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
23	Jen Waya	Dawan	1234567899	Female	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
24	Clint Aparo	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
25	Rex Pamat	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
26	Ricardo Dalisay	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
27	James Morales	Dawan	1234567899	Male	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
28	Mary Banate	Dawan	1234567899	Female	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X
29	Jenny Belroy	Dawan	1234567899	Female	Junior High - Grade 7	<a href="#">View Module</a>	<a href="#">Update</a> X

Figure 4. 4: Generate a list and data of the students

Figure 4.4 shows that the developers achieve the fourth objective of the system, which can generate a list and data of the students. Users can see the list and data of the students they added to the class to identify who has the wrong information in the list in this objective. They can also check the student modules by clicking View Module; they can also update and delete a student in a class. The above figure displayed the result of the project objectives.

#### 4.1.1.5 Provide a summary report of all the module records

The screenshot shows a 'Module Report' page titled 'List of module'. It displays a table with the following data:

ID	MODULE NO	NAME	DESCRIPTION
11	1	English	Verb
12	2	Filipino	Wikang Filipino
13	3	Science	Values
14	4	Math	Algebra
15	2	English 2	Noun
16	1	Filipino 2	Mapa
17	1	Science 2	Cell
18	2	Math 2	Equation

Figure 4. 5: Provide a summary report of all the module list

Figure 4.5 shows that the developers achieve the fifth objective of the system, which can provide a summary report of all the module lists for the users to identify what module has wrong information. Users can also print the list of all the modules. The above figure displayed the result of the project objectives.

#### 4.1.1.6 Provide a summary report of every student's records

The screenshot shows a 'STUDENT SUMMARY REPORT' page for a student named Wade Harris, Junior High - Grade 7. It displays a table with the following data:

ID	Barcode	Module Name	Description	Status	Date Distributed	Date Returned	Scores
49	MNO-1000	(1) English	Verb	Returned	2021-12-15	2021-12-16	
50	MNO-1001	(2) Filipino	Wikang Filipino	Returned	2021-12-15	2021-12-16	
51	MNO-1002	(3) Science	Values	Returned	2021-12-15	2021-12-16	
52	MNO-1003	(4) Math	Algebra	Returned	2021-12-15	2021-12-16	

Figure 4. 6: Provide a summary report of every student's records

Figure 4.6 shows that the developers achieve the sixth objective of the system, which can provide a summary report of every student record to check the student's

status. They can also print a copy of the student records if students need a copy of their records. The above figure displayed the result of the project objectives.

#### 4.1.1.7 Provide a Barcode for every module

The screenshot shows a user interface for managing student modules. At the top, there's a header with the title 'DNHS-Teacher' and a search bar. Below the header, a sidebar on the left lists 'Dashboard', 'Class', and 'Modules'. The main content area displays a student profile for 'Wade Harris' from 'Junior High - Grade 7'. A table below the profile lists four modules, each with a barcode, ID, name, and description. The modules are:

ID	Barcode	Module Name	Description
49		(1) English	Verb
50		(2) Filipino	Wikang Filipino
51		(3) Science	Veins
52		(4) Math	Algebra

Figure 4. 7: Provide a Barcode for every module

Figure 4.7 shows that the developers achieve the seventh objective of the system, which can provide a barcode for every module. Barcodes are applied to modules to quickly identify them in returning the module by scanning the barcode using a barcode reader/scanner. The above figure displayed the result of the project objective.

## CHAPTER V

### SUMMARY, CONCLUSION, AND RECOMMENDATION

#### 5.1 Summary

The project's first objective was completed when the system successfully provided features that users, especially the teachers, could add, save, and update a module or student information. The second objective was completed when the system provided a database for the records of the transaction of the student's module. The third objective was achieved when the users added module information, and the system could generate a list of the modules. The fourth objective was completed when the researchers created a function that the system can generate the list and the students' data added to the class. The fifth and sixth objective was achieved when the system could show the summary report of modules and summary reports of students, and the system could also print all the reports. The seventh objective was successfully achieved when the system could automatically generate a barcode for every module added to a student using a barcode scanner. Teachers found it simple to record the returned module by scanning the barcode.

Limitations. However, the developers could not design a complete system due to time and

All functions and system features enable help the teachers of Dawan National High School to attain convenience in monitoring the retrieving and distributing of the students' modules. Hence, only the teacher can have access to the said module monitoring system to ensure that there will be confidentiality with regards to the students' progress to eliminate comparisons and any other conflicts.

- add a student sheet for the teacher to monitor students' grades.
- add some notifications to remind students of the upcoming release and retrieval of modules.

## 5.2 Conclusion

This project was conducted to help Dawan National High School teachers monitor the student modules. The downside of having a modular class is that teachers must construct and securely maintain a significant number of printed papers for compilation and recording purposes in connection with the release and return of students' modules.

This system aims to provide modifications such as adding, saving, and updating modules and student information and provide a database for the records of all the transactions of the student modules. Other features of the system are generating the list of modules and the students' data; it can provide a summary report for the module and every student record and, lastly, generate a barcode for every module. This project will help the teachers monitor the modules and monitor the status of their students.

## 5.3 Recommendation

The project can perform the functions according to the objectives and scope, and limitations. However, the developers could not design a complete system due to time and resource constraints. After the respondents were allowed to test the system, several provided honest feedback, and some of them gave some suggestions to improve the project.

The following are recommendations for the project improvements:

- add a student sheet for the teacher to monitor students' grades;
- add sms notification to remind students of the upcoming release and retrieval of modules;

- add features that can also monitor students' outputs like projects, assignments; and
- add a feature that students can create an account in the system to check the student records if the module is returned or not.

### Literature Cited

- Alvarez, Abel V, Jr. (2020) The Phenomenon of Learning at a Distance through Emergency Remote Teaching amidst the Pandemic Crisis  
<https://eric.ed.gov/?id=EJ1289949>
- Al Wadani, Fahad. (2020). An Online Dermatology Teaching Module for Undergraduate Medical Students amidst the COVID-19 Pandemic: An Experience and Suggestions for the Future  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7735011/>
- Carillo, Carmen. (2020). COVID-19 and teacher education: a literature review of online teaching and learning practices org/10.1080/02619768.2020.1821184
- Chin, Mean. (2020). Students' New Normal: Modular Distance Learning  
<https://www.uniquephilippines.com/students-new-normal-modular-distance-learning/>
- Convophile (2020) Classroom-Monitoring-System  
<https://medium.com/analytics-vidhya/classroom-monitoring-system-4b6f20813699>
- Cotton, Kathleen (n.d) Student Learning in the Classroom  
<https://educationnorthwest.orgyy>
- Espineli, Nina. (2021). Lived Experiences of Master Teachers in Monitoring Modular Distance Learning (MDL) Teachers at TMCNHS.  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3811648](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3811648)
- San Pascual, Daniel. (2016). WEB-BASED DOCUMENT TRACKING AND MANAGEMENT SYSTEM <https://ejournals.ph/article.php?id=10833>
- Schubert, Carol. (2014). Understanding Modular Learning--Developing a Strategic Plan to Embrace Change <https://eric.ed.gov/?id=EJ1097629>
- SpringerLink (2020) Learner satisfaction, engagement and performances in an online module: Implications for institutional e-learning policy  
<https://link.springer.com/article/10.1007/s10639-020-10375-1>
- Sriram (2019). Top 10 issues around school management and how to solve them easily  
<https://www.creatrixcampus.com/blog/top-10-issues-around-school-management-and-how-solve-them-easily>
- Swan, Karen. (2006). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses  
<https://org/10.1080/0158791010220208>
- Tercan, Gulsan. (2018) Evaluating the Modular System of Preparatory Class Program  
<https://dergipark.org.tr/en/pub/eltrj/issue/40004/475578>

**Carl Patrick G. Duero**  
Nha Village, City of Mati, Davao Oriental  
Cell # 09126343303  
Carlduero0718@gmail.com



#### PERSONAL DATA

Date of Birth	:	July 18, 1998
Age	:	23
Place of birth	:	Mati City
Sex	:	Male
Height	:	5'8ft
Weight	:	62kg
Civil Status	:	Single
Nationality	:	Filipino

#### SKILLS AND INTEREST

- ✓ Computer Literate (MS Office Word, Excel, Ppt, Publisher)
- ✓ Video Editing
- ✓ Web Design

#### EDUCATIONAL BACKGROUND

**TERTIARY** Bachelor of Science in Information Technology  
Davao Oriental State University  
Guang-guang, Dahican, City of Mati  
Batch 2020-2021

**SECONDARY** Davao Oriental State University (Senior High)  
Batch 2017-2018  
Davao Oriental Regional Science High School (Junior High)  
Batch 2015-2016  
Dahican, City of Mati

**ELEMENTARY** BGR Executive Elementary School  
Menzi Dahican, City of Mati  
Batch 2011-2012

#### REFERENCES

Wilkin F. Simo  
DOOrSU BSIT Faculty



- Tria, J. Z. (2020). The COVID-19 Pandemic through the Lens of Education in the Philippines: The New Normal. ResearchGate.  
[https://www.researchgate.net/publication/341981898\\_The\\_COVID19\\_Pandemic\\_through\\_the\\_Lens\\_of\\_Education\\_in\\_the\\_Philippines\\_The\\_New\\_Normal](https://www.researchgate.net/publication/341981898_The_COVID19_Pandemic_through_the_Lens_of_Education_in_the_Philippines_The_New_Normal)
- Yakub, Saheed. (2016) Attendance Management System Using Barcode Identification on Students' Identity Cards  
[https://www.researchgate.net/publication/328102861\\_Attendance\\_Management\\_System\\_Using\\_Barcod... Identity Cards](https://www.researchgate.net/publication/328102861_Attendance_Management_System_Using_Barcod...)
- Zhuraeva Gulbahor (2020) The Course Of Pathological Anatomy In A Modular System, As A New Teaching Technology In A Medical University  
<https://www.usajournalshub.com/index.php/tajas/article/view/1525>
- Zulhaimi Zulkifli (2009) Electronic Document Tracking System (EDTS): A Prototype  
Electronic Document Tracking System (EDTS): A Prototype | SpringerLink
- Zulqadar, Amna. (2019). SDLC Waterfall Model: The 6 phases you need to know about  
<https://rezaid.co.uk/sdlc-waterfall/?fbclid=IwAR0LhWTUuFb6dg03Pz69FX5npR-5q47HBC6xpSvAumPWnq55Uod4YVrO70>



Romie Matangcas

Lopez Nazareno, City of Mati, Davao Oriental  
Cell # 09565505370  
Rjmatangcas@gmail.com

#### PERSONAL DATA

Date of Birth	October 22, 1999
Age	22
Place of birth	Davao City
Sex	Male
Height	5'7ft
Weight	60kg
Civil Status	Single
Nationality	Filipino

#### SKILLS AND INTEREST

- ✓ Computer Literate (MS Office Word, Excel, Ppt, Publisher)
- ✓ Web Design
- ✓ Interpersonal Skills
- ✓ Video Editing

#### EDUCATIONAL BACKGROUND

**TERtiARY** Bachelor of Science in Information Technology

Davao Oriental State University  
Guang-guang, Dahican, City of Mati  
Batch 2020-2021

**SECONDARY**

Davao Jones Academy (Senior High)  
Batch 2017-2018  
Daniel R. Aguinaldo National High School (Junior High)  
Batch 2015-2016  
Davao City

**ELEMENTARY**

Magallanes Elementary School  
Davao City  
Batch 2011-2012

#### REFERENCES

Wilkin F. Simo  
DOsU BSIT Faculty

**Carl Patrick G. Duero**  
Nha Village, City of Mati, Davao Oriental  
Cell # 09126343303  
Carlduero0718@gmail.com



#### PERSONAL DATA

Date of Birth	:	July 18, 1998
Age	:	23
Place of birth	:	Mati City
Sex	:	Male
Height	:	5'8ft
Weight	:	62kg
Civil Status	:	Single
Nationality	:	Filipino

#### SKILLS AND INTEREST

- ✓ Computer Literate (MS Office Word, Excel, Ppt, Publisher)
- ✓ Video Editing
- ✓ Web Design

#### EDUCATIONAL BACKGROUND

**TERTIARY** Bachelor of Science in Information Technology  
Davao Oriental State University  
Guang-guang, Dahican, City of Mati  
Batch 2020-2021

**SECONDARY** Davao Oriental State University (Senior High)  
Batch 2017-2018  
Davao Oriental Regional Science High School (Junior High)  
Batch 2015-2016  
Dahican, City of Mati

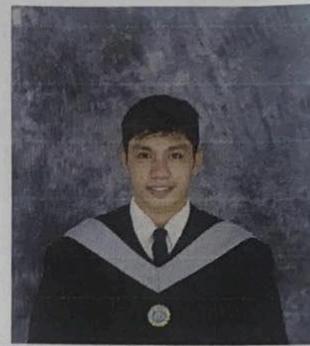
**ELEMENTARY** BGR Executive Elementary School  
Menzi Dahican, City of Mati  
Batch 2011-2012

#### REFERENCES

Wilkin F. Simo  
DOOrSU BSIT Faculty

**Shechem D. Dindin**

Urban Poor Guang-guang, City of Mati, Davao Oriental  
Cell # 09950534225  
Shechemd@gmail.com



#### **PERSONAL DATA**

Date of Birth	:	January 24, 2000
Age	:	20
Place of birth	:	Mati City
Sex	:	Male
Height	:	5ft
Weight	:	50kg
Civil Status	:	Single
Nationality	:	Filipino

#### **SKILLS AND INTEREST**

- ✓ Computer Literate (MS Office Word, Excel, Ppt, Publisher)
- ✓ Video Editing
- ✓ Web Design
- ✓ Music Editing

#### **EDUCATIONAL BACKGROUND**

**TERTIARY** Bachelor of Science in Information Technology  
Davao Oriental State University  
Guang-guang, Dahican, City of Mati  
Batch 2020-2021

**SECONDARY** Davao Oriental State University (Senior High)  
Batch 2017-2018  
Davao Oriental Academy (Junior High)  
San Isidro Davao Oriental  
Batch 2015-2016

**ELEMENTARY** Maitum Elementary School  
Tubaon Tarragona Davao Oriental  
Batch 2011-2012

#### **REFERENCES**

Wilkin F. Simo  
DOsSU BSIT Faculty