



# VAAL UNIVERSITY OF TECHNOLOGY

Inspiring thought. Shaping talent.

**Project Title:** Development of a Secure Online System for Student Check-Ins, Logbook Management, and WIL Monitoring.

**Company:** Moepi Publishing

**Mentor:** M.A Ramapuputla

**Date:** 15 October 2025 to 25 November 2025

**Prepared by:**

Codnell Chabalala

221648380

## **Declaration**

I declare that this is my original work and that it has not been presented to any other university or institution for similar or any other degree award.

---

Signature

Date

This is to certify that this research project titled: ....., written by Codnell Chabalala with the 221648380 under my supervision.

Signature

Date

## Acknowledgement

## **Abstract**

# Table of Contents

|   |      |
|---|------|
| Declaration .....                             | ii   |
| Acknowledgement.....                          | iii  |
| Abstract.....                                 | iv   |
| Acronyms and Abbreviations .....              | viii |
| Chapter 1: Introduction.....                  | 1    |
| 1.1 INTRODUCTION .....                        | 1    |
| 1.2 PROBLEM STATEMENT .....                   | 1    |
| 1.3 DELIMITATION .....                        | 2    |
| 1.4 ASSUMPTIONS .....                         | 2    |
| 1.5 RESEARCH OBJECTIVES:.....                 | 2    |
| 1.6 IMPORTANCE OF STUDY .....                 | 3    |
| 1.7 CHAPTER OUTLINES .....                    | 4    |
| 1.8 SUMMARY .....                             | 4    |
| Chapter 2: Literature Review .....            | 5    |
| 2.1 INTRODUCTION .....                        | 5    |
| 2.2 LITERATURE RIVIEW .....                   | 5    |
| 2.2 Conceptual framework of the project ..... | 6    |
| 2.3 THEORETICAL FRAMEWORK.....                | 7    |
| 2.4 SUMMARY.....                              | 8    |
| Chapter 3: Project Methodology .....          | 9    |
| 3.1 INTRODUCTION .....                        | 9    |
| 3.2 Research Design .....                     | 9    |
| 3.3 Method of Data Analysis .....             | 10   |
| 3.4 Presentation and Analysis of Data.....    | 10   |
| 3.6 Technologies Used.....                    | 11   |
| 3.7 FRONTEND Screenshots.....                 | 12   |
| 3.8 BACKEND Screenshots.....                  | 17   |

|                                    |    |
|------------------------------------|----|
| 3.8.3 Database .....               | 18 |
| 3.9 Summary.....                   | 19 |
| Chapter 4: Findings .....          | 20 |
| 4.1 Introduction .....             | 20 |
| 4.2 Summary of main findings ..... | 20 |
| 4.3 Recommendations .....          | 20 |
| 4.4. Further Research.....         | 21 |
| REFERENCES .....                   | 22 |

**No table of figures entries found.**

|   |    |
|---|----|
| Figure 1: Registration page .....       | 12 |
| Figure 2:Login page .....               | 13 |
| Figure 3:Student Dashboard .....        | 13 |
| Figure 4: mictseta dashboard.....       | 14 |
| Figure 5:wil coordinator dashboard..... | 15 |
| Figure 6:mentor dashboard.....          | 15 |
| Figure 7:2FA Verification page.....     | 16 |
| Figure 8:Password Reset Page.....       | 16 |
| Figure 9:Check in system folder.....    | 17 |
| Figure 10:Python file.....              | 17 |
| Figure 11:Database .....                | 18 |
| Figure 12:Requirements .....            | 18 |

## **Acronyms and Abbreviations**

|         |                          |
|---------|--------------------------|
| WIL     | Work Integrated Learning |
| MICSETA |                          |
| SETA    |                          |
|         |                          |
|         |                          |
|         |                          |

# **Chapter 1: Introduction**

## **1.1 INTRODUCTION**

### **Scope:**

This project is about creating an online system that helps students record their attendance, upload logbooks, and submit timesheets while doing work integrated learning. It also helps mentors, WIL coordinators, and MICSETA administrators easily track and check student progress online in real time.

### **Context:**

WIL helps students gain real work experience while studying. It allows students to apply academic knowledge in real work environments. However, many institutions still use emails to track student progress, which is slow and often inaccurate. Using technology can solve these problems by making WIL monitoring easier, faster, and more reliable through a secure online system that helps students, mentors, and coordinators work together better.

### **Importance:**

This project is important because it makes tracking student progress in WIL faster, safer, and more reliable. It combines everything into one online system where students, mentors, and WIL co-ordinator can easily manage attendance and reports. The system saves time, keeps data safe, and helps students stay responsible. Overall, it makes WIL programs more organized, secure, and efficient for everyone, addressing a critical gap in the education and training sector.

## **1.2 PROBLEM STATEMENT**

The main problem is the difficulty in accurately tracking student attendance and progress during Work-Integrated Learning (WIL). Many institutions still use paper logbooks and manual registers, which are time-consuming, unreliable, and often contain errors. This makes it hard for mentors, WIL coordinators, and SETA administrators to monitor student activities and provide timely feedback.

This problem is important because ineffective tracking can lead to poor communication, delayed assessments, and a lack of accountability in WIL programs. Developing a secure online system can help solve this issue by allowing students to record their daily activities digitally while giving administrators real-time access to monitor and evaluate student progress efficiently

## **1.3 DELIMITATION**

This project will not include advanced features such as payroll management, detailed academic grading systems, or the development of a separate mobile application. The main focus will be on creating a functional and secure web-based platform that allows students to record their daily attendance, upload logbooks, and submit timesheets during their WIL placement. Mentors, coordinators, and SETA administrators will use the same platform to monitor student progress, verify attendance, and generate reports. By limiting the project scope to WIL tracking and reporting, the development process remains focused, manageable, and aligned with the core objective of improving efficiency and transparency in student monitoring.

## **1.4 ASSUMPTIONS**

This project assumes that everyone using the system (students, mentors, WIL coordinators, and SETA administrators) will have internet access and a device that can open a web browser. It also assumes that users know how to use basic computer features like logging in, uploading files, and viewing reports. The system expects that institutions already have their own ways to check attendance and assess logbooks, and the system will only help with these processes, not replace them. Lastly, it is assumed that all users will give correct and honest information when using the system.

## **1.5 RESEARCH OBJECTIVES:**

### **Main objective:**

To design and implement a web-based Work-Integrated Learning (WIL) monitoring system that enables students, mentors, WIL coordinators, and SETA administrators to track student activities, attendance, and progress effectively.

### **Specific Objectives:**

#### **Objective 1:**

- To develop a secure, web-based platform for students to check in three times daily and record their current activities.

#### **Objective 2:**

- To implement an authentication system that ensures only registered students, mentors, WIL coordinators, and SETA administrators can access the system

#### **Objective 3:**

- To integrate a database for storing student check-ins, logbook submissions, monthly timesheets, and user profiles.

#### **Objective 4:**

- To provide mentors, WIL coordinators, and SETA administrators with an interactive dashboard to view, filter, and monitor student progress.

**Objective 5:**

- To allow mentors to upload graded and signed logbooks and monitor student daily activities.

**Objective 6:**

- To enable SETA administrators to download student monthly timesheets for verification and overall progress tracking.

**Objective 7:**

- To deploy the system in a centralized environment accessible to all users for efficient monitoring and reporting.

## 1.6 IMPORTANCE OF STUDY

The Check-In System will play a vital role in improving the monitoring and accountability of students participating in Work-Integrated Learning (WIL) programs. It provides an innovative solution to ensure that students are genuinely completing their required daily activities and check-ins.

For SETA administrators, the system offers reliable and verifiable data that can be used for reporting, auditing, and evaluating student progress. For mentors and WIL coordinators, it simplifies the process of tracking student activities, reviewing logbooks, and monitoring performance, reducing administrative workload and improving efficiency. For students, it provides a transparent and convenient way to record daily check-ins, submit logbooks, and upload monthly timesheets, whether they are working on-site or remotely.

From an academic and technical perspective, this project demonstrates the practical application of web development, database integration, authentication mechanisms, and interactive dashboards to solve real-world challenges faced by educational and professional institutions operating under hybrid training models

## **1.7 CHAPTER OUTLINES**

Chapter 1 introduces the background of the study and explains the problem, purpose, and objectives of developing the web-based WIL Check-In System. It also discusses the scope, limitations, and importance of the project.

Chapter 2 provides the theoretical framework of the study and includes a detailed literature review related to WIL monitoring systems, digital check-in tools, and web-based solutions.

Chapter 3 describes the research methodology used in the project. It explains the system development process, tools, technologies, and the data collected during the design and implementation of the system.

Chapter 4 presents the summary, conclusions, and recommendations of the study, showing how the system solves the problem and suggesting improvements for future development.

## **1.8 SUMMARY**

Chapter 1 introduces the development of a web-based Check-In System designed to improve the monitoring of students participating in Work-Integrated Learning (WIL). The chapter explains that many institutions still rely on paper-based and email-driven processes, which are slow, inaccurate, and difficult to manage. The proposed system provides a centralized online platform where students can record attendance, submit logbooks, and upload timesheets, while mentors, WIL coordinators, and SETA administrators can monitor progress in real time.

The problem addressed is the lack of accurate and efficient tools for tracking student activities during WIL, leading to delays, errors, and poor communication. The chapter outlines the scope of the project, which focuses on WIL monitoring only, excluding advanced features such as payroll and mobile app development. Assumptions include user access to the internet and basic computer skills.

The main objective is to design and implement a secure online system for monitoring WIL activities. Specific objectives include developing check-in features, authentication mechanisms, a database, dashboards, logbook review tools, and administrator reporting functions, as well as deploying the system in a centralized environment.

Finally, the chapter highlights the importance of the study, emphasizing how the system enhances accountability, transparency, and efficiency for all stakeholders involved in WIL. The project also demonstrates practical application of web technologies to solve real-world academic and administrative challenges.

## **Chapter 2: Literature Review**

### **2.1 INTRODUCTION**

This chapter presents a review of existing literature related to attendance monitoring systems, Work-Integrated Learning (WIL), and digital tracking solutions in educational and workplace settings. It explores previous studies, theoretical frameworks, and technological approaches that have been applied to monitor learner or employee activities, track progress, and improve accountability. The chapter also highlights gaps in current methods and identifies the need for a secure, web-based system like the Check-In System to support efficient monitoring of student participation during WIL programs.

### **2.2 LITERATURE RIVIEW**

Attendance monitoring and Work-Integrated Learning (WIL) are essential for ensuring that students gain real workplace experience while staying accountable for their activities. Research shows that accurate tracking of attendance and tasks supports performance evaluation, communication between students and mentors, and overall program effectiveness (Smith & Jones, 2020; Nkosi, 2019). Traditional methods, such as paper logbooks and manual registers, are still widely used, but they are often slow, prone to errors, and difficult to manage. These weaknesses can lead to incomplete records, delayed feedback, and miscommunication between students, mentors, and administrators.

Digital solutions have been developed to address these limitations. Online check-in systems and mobile apps allow real-time tracking of student activities, reduce administrative workload, and provide instant access to performance data (Patel & Kumar, 2021). Interactive dashboards make it easier for mentors and coordinators to monitor trends, identify students who need support, and generate reports efficiently. Despite these advantages, some studies note challenges, such as the need for reliable internet, potential security risks, and difficulties for users unfamiliar with technology (Adeyemi, 2020). This indicates that while digital systems improve efficiency, careful design and user training are necessary to ensure success.

The literature also highlights the importance of theoretical frameworks in designing effective monitoring systems. Activity Theory explains how digital tools can mediate learning tasks and improve accountability by linking student activities with reporting mechanisms. Systems Theory emphasizes that the success of a monitoring system depends on the interaction of its components, including students, mentors, administrators, and technology. The Technology Acceptance Model (TAM) shows that ease of use and perceived usefulness are key factors influencing whether users adopt new digital systems. By combining these insights, it becomes clear that a secure, web-based WIL Check-In System can address gaps in traditional methods while supporting accountability, monitoring, and data-driven decision-making.

In summary, the reviewed literature demonstrates that traditional attendance tracking methods are inefficient and prone to errors, while digital systems offer significant improvements in efficiency, accuracy, and real-time monitoring. However, challenges such as accessibility, security, and user adoption must be considered. These findings support the need for a secure, user-friendly Check-In System that integrates attendance tracking, logbook submission, and timesheet management into a single platform, improving WIL monitoring and program effectiveness.

## **2.2 Conceptual framework of the project**

The conceptual framework of the Check-In System outlines the key concepts, definitions, and ideas that form the foundation of the study. It provides a structured understanding of how the system functions and its role in monitoring Work-Integrated Learning (WIL) activities.

### **Key Concepts:**

1. **Work-Integrated Learning (WIL):** WIL refers to educational programs that combine academic learning with practical workplace experience. It allows students to apply theoretical knowledge in real work environments while gaining professional skills. In this study, WIL is the central activity being monitored through student check-ins, logbook submissions, and timesheets.
2. **Attendance Monitoring:** This concept involves tracking the presence and activities of students in a structured manner. Traditional attendance methods, such as paper registers,

are prone to errors and inefficiencies. The Check-In System applies digital attendance monitoring to ensure accuracy, accountability, and ease of verification.

3. **Web-Based System:** A web-based system is an online platform accessible through browsers, enabling users to perform tasks remotely. The Check-In System leverages this technology to allow students, mentors, WIL coordinators, and SETA administrators to access the system anytime and anywhere.
4. **Authentication and Security:** Authentication ensures that only authorized users can access the system. This is critical to protect sensitive data, maintain integrity of student records, and prevent unauthorized access.
5. **Dashboard and Reporting:** Interactive dashboards and reporting features allow mentors, WIL coordinators, and SETA administrators to monitor student check-ins, view logbooks, and generate monthly timesheets. This concept supports informed decision-making and performance evaluation.

By linking these concepts, the conceptual framework provides a clear understanding of how the Check-In System operates to achieve its objectives of improving accountability, monitoring student activities, and supporting the efficient management of WIL programs.

## 2.3 THEORETICAL FRAMEWORK

The theoretical framework of the Moepi Check-In System project provides the underlying principles and theories that guide the design, implementation, and evaluation of the system. It links the problem of monitoring student activities during Work-Integrated Learning (WIL) to established theories in education, technology adoption, and workplace learning.

### 1. Activity Theory:

Activity Theory emphasizes the relationship between individuals, their tasks, and the tools they use to achieve objectives. In the context of this study, students are the subjects, WIL tasks are the activities, and the Check-In System serves as the mediating tool that enables effective monitoring and reporting. This theory supports the idea that digital tools can enhance productivity, accountability, and learning outcomes in workplace-based training.

### 2. Systems Theory:

Systems Theory focuses on understanding how different components of a system interact to achieve a common goal. The Check-In System can be viewed as a system comprising students, mentors, WIL coordinators, SETA administrators, and a web-based platform. Each component

interacts to collect, process, and report data on student activities. This framework helps explain how the system integrates various elements to improve monitoring, data accuracy, and decision-making.

### **3. Technology Acceptance Model (TAM):**

The Technology Acceptance Model explains how users come to accept and use technology based on perceived usefulness and ease of use. Applying TAM to the Check-In System highlights the importance of designing an intuitive, user-friendly interface that encourages students, mentors, and administrators to actively engage with the platform, thereby ensuring reliable attendance tracking and performance monitoring.

By anchoring the study on these theories, the project establishes a solid foundation for understanding how a web-based monitoring system can improve WIL management, enhance accountability, and support both educational and administrative objectives.

## **2.4 SUMMARY**

The literature shows that tracking student activities during Work-Integrated Learning (WIL) is essential for accountability, performance evaluation, and effective program management. Traditional methods, such as paper logbooks and manual registers, are commonly used but are slow, prone to errors, and difficult to manage. Digital solutions, including online check-in systems and dashboards, improve efficiency, provide real-time monitoring, and reduce administrative workload. However, challenges such as internet access, data security, and user adoption must be addressed for these systems to be effective.

These findings highlight the significance of developing a secure, web-based Check-In System. By integrating attendance tracking, logbook submissions, and timesheet management into one platform, the system addresses the gaps identified in the literature. It directly responds to the problem of unreliable and time-consuming monitoring methods by providing a user-friendly and efficient solution for students, mentors, WIL coordinators, and SETA administrators.

## **Chapter 3: Project Methodology**

### **3.1 INTRODUCTION**

The methodology chapter outlines how the web-based Check-In System was designed, developed, and implemented to improve monitoring of student activities during Work-Integrated Learning (WIL). It connects the findings from the literature review to practical steps taken in the project. The chapter explains the research approach, system design methods, data collection and analysis procedures, and testing strategies used to ensure the system is functional, reliable, and secure.

### **3.2 Research Design**

The research design for the Moepi Check-In System project follows a descriptive and developmental approach, focusing on the design, development, and implementation of a web-based platform for monitoring student activities during Work-Integrated Learning (WIL) programs. This design serves as a blueprint for the project, guiding the steps required to achieve the system's objectives, from requirement analysis to deployment.

A descriptive approach is adopted to understand the challenges faced by students, mentors, WIL coordinators, and SETA administrators in tracking attendance, logging activities, and submitting reports. This involves studying existing attendance and monitoring methods to identify gaps and requirements for the new system.

The developmental aspect focuses on the actual creation of the web-based system. It involves system analysis, design, coding, database integration, testing, and deployment. This approach ensures that the system is tailored to the specific needs of WIL programs, providing secure login, multiple daily check-ins, logbook submission, interactive dashboards, and report generation.

By combining descriptive and developmental research designs, the project provides both a theoretical understanding of the problem and a practical solution through the implementation of a functional monitoring system.

### **3.3 Method of Data Analysis**

The method of data analysis for the Moepi Check-In System involves collecting, organizing, and examining data on student attendance, check-ins, logbook submissions, and monthly timesheets. Data is first prepared by collecting records from students, mentors, WIL coordinators, and SETA administrators and ensuring their accuracy and completeness.

The data is then tabulated in the system's database, organized by students, dates, activities, and user roles. This structure allows the system to generate summaries such as total daily check-ins, logbook submission status, and monthly timesheet reports.

Finally, analysis is carried out using the system's interactive dashboards and reporting tools. Patterns, trends, and irregularities in student activities are identified to help mentors, WIL coordinators, and SETA administrators evaluate performance, verify compliance with WIL requirements, and make informed decisions regarding supervision and training.

### **3.4 Presentation and Analysis of Data**

The data collected through the Moepi Check-In System is presented using interactive dashboards, tables, and charts, providing a comprehensive view of student attendance, daily check-ins, logbook submissions, and monthly timesheets.

On the admin dashboard, key statistics such as total check-ins, earliest check-in, most and least active students, and total absent days are displayed in cards for quick reference. Bar charts visualize monthly check-ins and check-ins by employee, highlighting trends and patterns in student activity. A pie chart provides an overview of attendance, showing the proportion of present versus absent students. The “All Employee Check-In History” table lists detailed records, including employee names, check-in dates, times, and comments. Pagination ensures efficient navigation through large datasets, displaying 10 records per page.

On the student dashboard, each student can view their daily check-in slots, record comments about current activities, and upload monthly timesheets. Cards indicate whether a check-in has been completed, while a table summarizes recent check-ins with timestamps and comments. This presentation allows students to track their own participation and maintain accountability.

The analysis of this data enables mentors, WIL coordinators, and SETA administrators to:

- Identify students who are consistently absent or late,
- Verify student activities and logbook submissions,
- Monitor daily and monthly performance trends, and
- Make informed decisions regarding supervision, feedback, and compliance with WIL requirements.

By combining visual dashboards, tables, and real-time updates, the system improves transparency, accountability, and efficiency in monitoring student progress during Work-Integrated Learning programs.

The system has a registration page where students, mentors, WIL coordinators, and administrators can create accounts by entering their name, email, password, user type, and organization. Dropdown menus make sure users select the correct roles and organizations.

Only users with email addresses ending in @tekete.co.za, @mictseta.org.za, or @vut.ac.za are allowed to register.

After registering, users can use the system for daily check-ins, logbook submissions, and monthly timesheet uploads. The registration page is simple, secure, and easy to use

### **3.6 Technologies Used**

The Moepi Check-In System was developed as a web-based application using modern and widely adopted technologies to ensure efficiency, reliability, and scalability. The backend of the system was implemented in Python, utilizing the Flask framework to handle server-side logic, routing, and database interactions. Flask provides a lightweight yet robust environment for developing web applications and enables seamless integration with frontend components.

The frontend was built using HTML, CSS, and JavaScript, providing a responsive and interactive interface for students, mentors, WIL coordinators, and SETA administrators. HTML structures the content, CSS defines the styling and layout, and JavaScript enables dynamic elements such as charts, tables, filtering, and pagination.

Data exchange between the frontend and backend is facilitated using JSON, allowing efficient transfer of check-in records, logbooks, and timesheet information. All records, including

attendance data, student comments, logbooks, and monthly timesheets, are stored securely in a MySQL relational database, ensuring data integrity and easy retrieval for reporting purposes.

The combination of these technologies ensures that the Moepi Check-In System is secure, user-friendly, and capable of supporting hybrid Work-Integrated Learning programs, providing administrators and mentors with real-time insights into student progress and participation.

## 3.7 FRONTEND Screenshots

### 3.7.1 Registration Page

The screenshot shows a registration form titled "Register". It includes two radio button options: "Student" (selected) and "Admin". The form consists of several input fields: "Full Name" (placeholder: "Name Surname"), "Email" (placeholder: "Enter your Email"), "Password" (placeholder: "Enter your Password"), "Confirm Password" (placeholder: "Confirm Password"), "Student Number" (placeholder: "Enter Student Number"), "Type of Institution" (dropdown menu with placeholder: "-- Select --"), "Institution Name" (dropdown menu with placeholder: "-- Select Institution --"), and a "Department" field. At the bottom right of the form, there is a copyright notice: "© 2025 Moepi Publishing — All Rights Reserved".

Figure 1: Registration page

### 3.7.2 Login Page

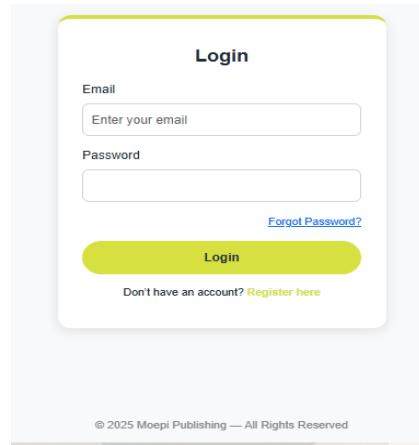


Figure 2: Login page

### 3.7.3 Student Dashboard

The dashboard for Codnelli Chabalala. It features a "Welcome, Codnelli Chabalala" message. A green banner at the top indicates "Two-factor authentication successful". The main area displays "Today's Check-ins (2025-11-17)" with three time slots: 11:00, 13:00, and 16:00. Each slot has a text input field asking "What are you working on?" and a green "Check In" button. To the right is a vertical sidebar with options: "Check-IN", "Upload Timesheet", "Upload Assignment", and "Logout". Below the check-ins is a section for "Recent Check-ins" showing a table with columns: Date, Time Slot, Comment, and Timestamp.

Figure 3: Student Dashboard

### 3.7.4 Mictseta Dashboard

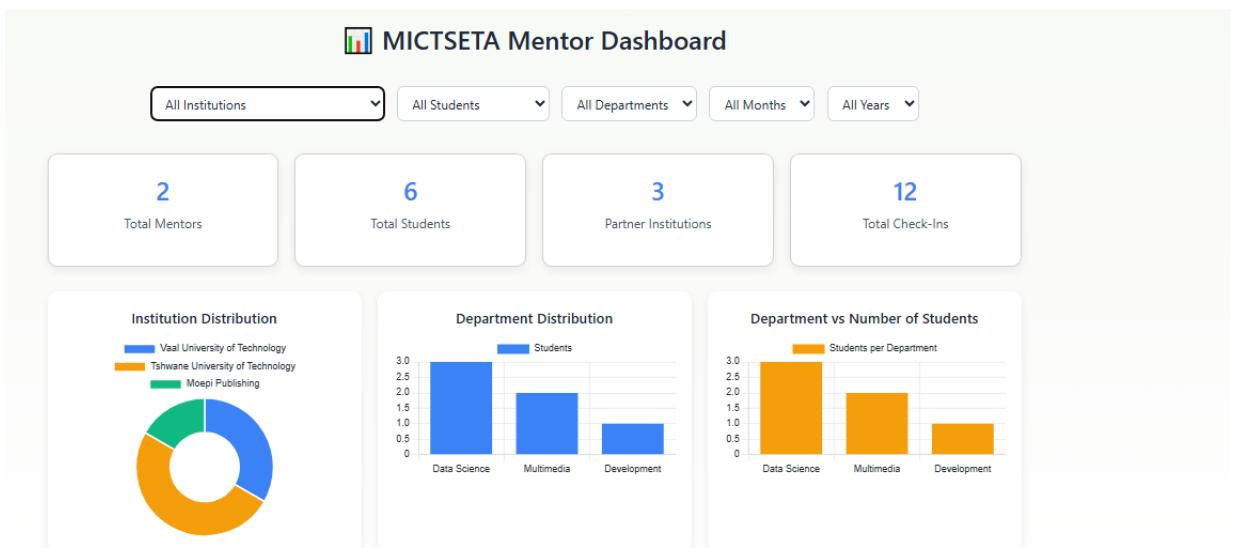


Figure 4: mictseta dashboard

### 3.7.5 WIL Coordinator Dashboard

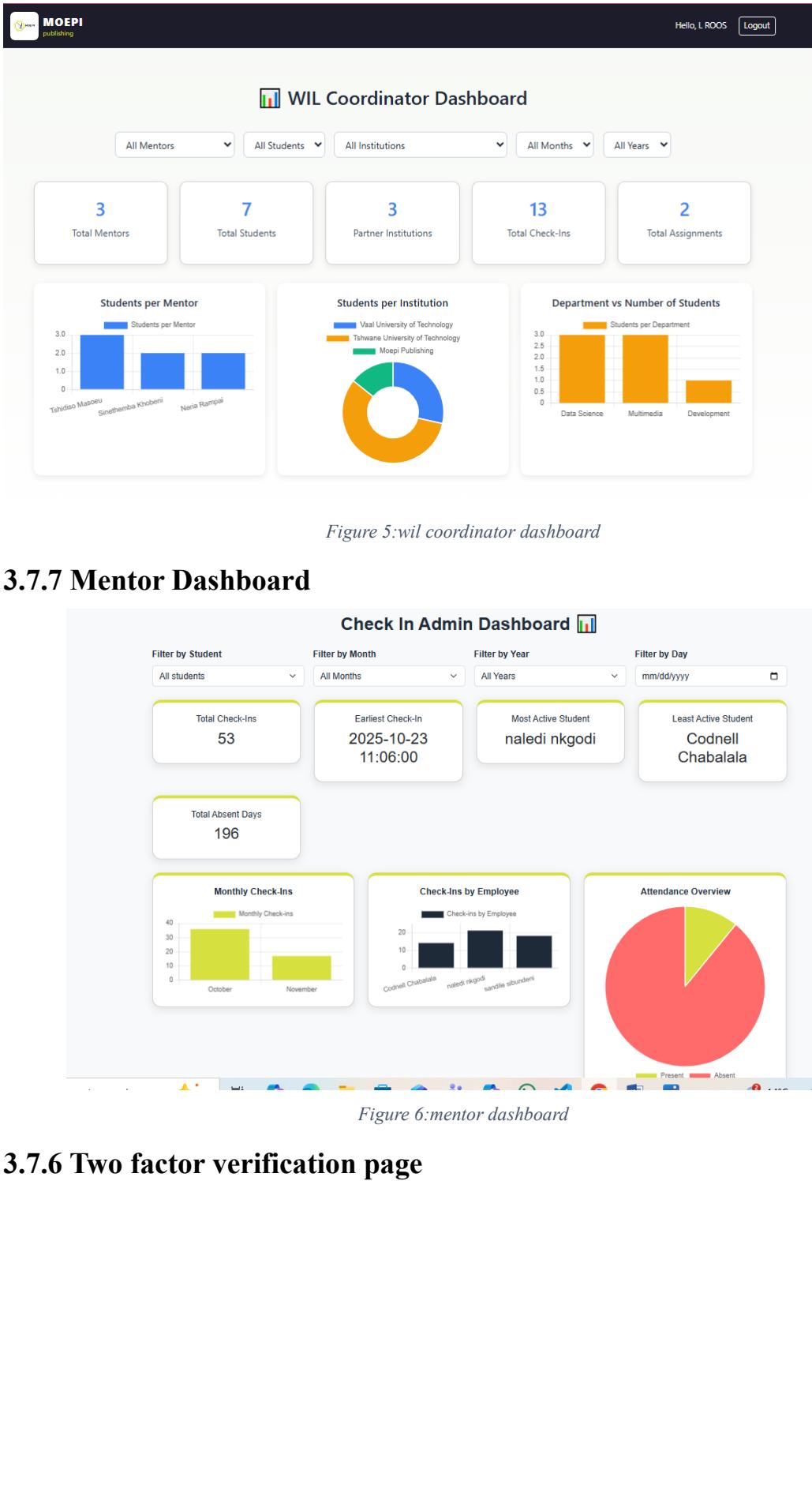


Figure 5:wil coordinator dashboard

### 3.7.7 Mentor Dashboard

#### Two factor verification page

### 3.7.6 Two factor verification page

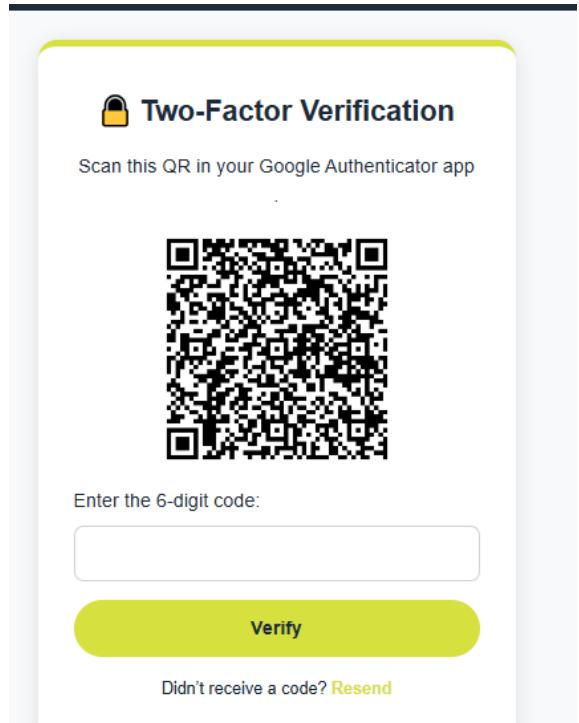


Figure 7:2FA Verification page

### 3.7.7 Password Reset Page

A screenshot of a "Forgot Password" page. At the top, it says "Forgot Password". Below that, it says "Enter your email address and we'll send you a link to reset your password.". There is an "Email" label above a text input field containing "email". Below the input field is a green "Send Reset Link" button. At the bottom, it says "Remember your password? [Login here](#)".

Figure 8:Password Reset Page

## 3.8 BACKEND Screenshots

### 3.8.1 FOLDER

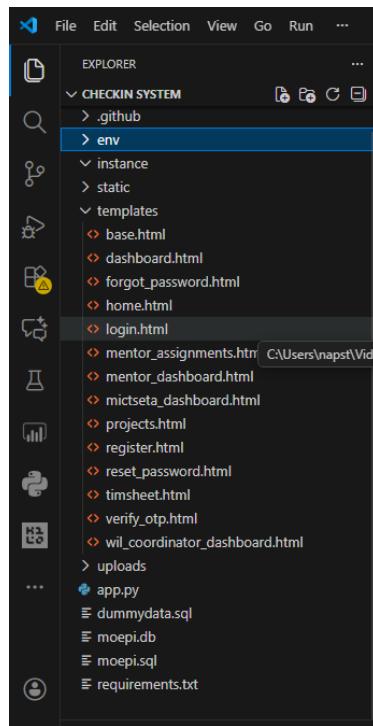
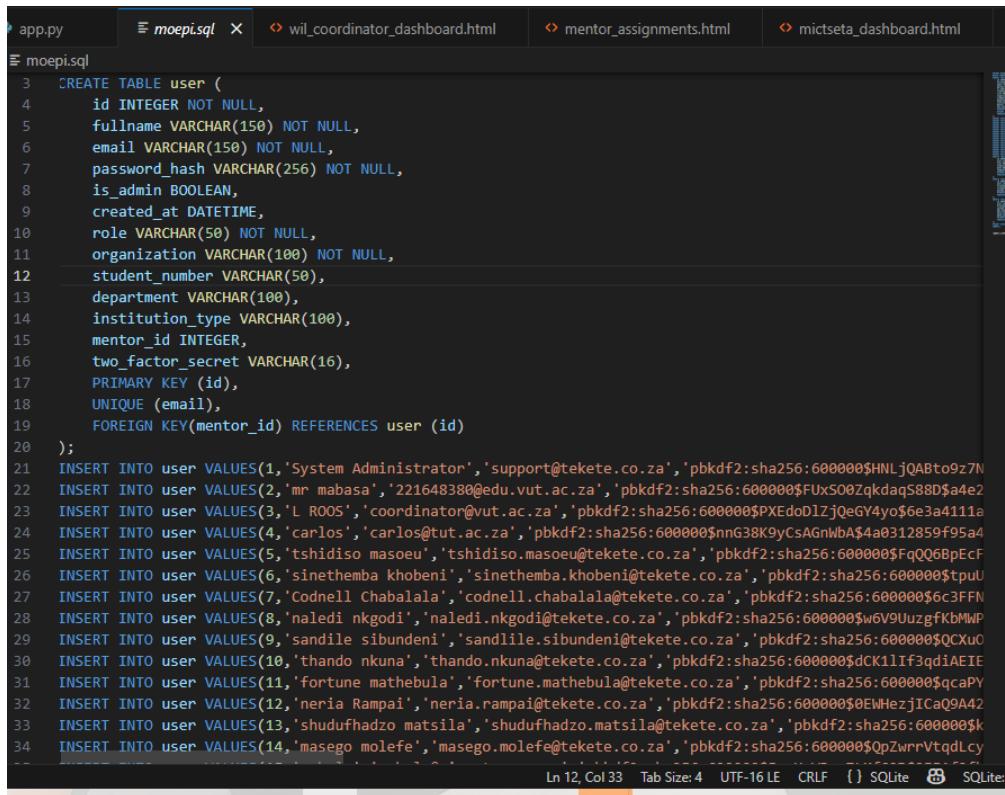


Figure 9: Check in system folder

### 3.8.2 PYTHON

```
app.py X E moepi.sql O wil_coordinator_dashboard.html O mentor_assignments.html O mictseta_dashboard.html app.py > dashboard
1 from flask import Flask, render_template, request, redirect, url_for, flash, jsonify, send_from_directory
2 from datetime import datetime, timedelta
3 from flask import session
4 from flask_sqlalchemy import SQLAlchemy
5 from flask_login import LoginManager, login_user, logout_user, login_required, current_user, UserMixin
6 from werkzeug.security import generate_password_hash, check_password_hash
7 from werkzeug.utils import secure_filename
8 from flask_mail import Mail, Message
9 from itsdangerous import URLSafeTimedSerializer
10 import os
11 import pyotp
12 import qrcode
13 import io
14 import base64
15 from sqlalchemy import func
16 from flask import send_from_directory, abort
17 import os
18 from flask import send_file
19
20
21 BASE_DIR = os.path.dirname(os.path.abspath(__file__))
22
23 app = Flask(__name__)
24 app.config['SECRET_KEY'] = "replace this with a strong secret key"
25 app.config['SQLALCHEMY_DATABASE_URL'] = 'sqlite:////' + os.path.join(BASE_DIR, 'moepi.db')
26 app.config['SQLALCHEMY_TRACK_MODIFICATIONS'] = False
27
28 # Upload settings
29 app.config['UPLOAD_FOLDER'] = os.path.join(BASE_DIR, 'static', 'uploads', 'timesheets')
30 app.config['MAX_CONTENT_LENGTH'] = 10 * 1024 * 1024 # 10 MB
31 os.makedirs(app.config['UPLOAD_FOLDER'], exist_ok=True)
32
33 # Database configuration
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100 def wil_coordinator_dashboard():
    total_assignments=total_assignments,
    assignment_counts=assignment_counts,
    mentors=[serialize_user(m) for m in mentors],
    highest_checkin_student=highest_checkin_student,
    earliest_checkin=earliest_checkin,
    mentor_labels=list(mentor_counts.keys()),
    mentor_counts=list(mentor_counts.values()),
    institution_labels=institution_labels,
    institution_counts=institution_counts,
    dept_labels=dept_labels,
    dept_counts=dept_counts,
    student_filter=student_filter,
    month_filter=month_filter,
    year_filter=year_filter,
    department_filter=department_filter,
    now=now
)
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122     # ----- Run -----
123     if __name__ == '__main__':
124         app.run(debug=True)
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
259
260
261
262
263
264
265
266
267
268
269
269
270
271
272
273
274
275
276
277
278
279
279
280
281
282
283
284
285
286
287
288
289
289
290
291
292
293
294
295
296
297
298
299
299
300
301
302
303
304
305
306
307
308
309
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
329
330
331
332
333
334
335
336
337
338
339
339
340
341
342
343
344
345
346
347
348
349
349
350
351
352
353
354
355
356
357
358
359
359
360
361
362
363
364
365
366
367
368
369
369
370
371
372
373
374
375
376
377
378
379
379
380
381
382
383
384
385
386
387
388
389
389
390
391
392
393
394
395
396
397
398
399
399
400
401
402
403
404
405
406
407
408
409
409
410
411
412
413
414
415
416
417
418
419
419
420
421
422
423
424
425
426
427
428
429
429
430
431
432
433
434
435
436
437
438
439
439
440
441
442
443
444
445
446
447
448
449
449
450
451
452
453
454
455
456
457
458
459
459
460
461
462
463
464
465
466
467
468
469
469
470
471
472
473
474
475
476
477
478
479
479
480
481
482
483
484
485
486
487
488
489
489
490
491
492
493
494
495
496
497
498
499
499
500
501
502
503
504
505
506
507
508
509
509
510
511
512
513
514
515
516
517
518
519
519
520
521
522
523
524
525
526
527
528
529
529
530
531
532
533
534
535
536
537
538
539
539
540
541
542
543
544
545
546
547
548
549
549
550
551
552
553
554
555
556
557
558
559
559
560
561
562
563
564
565
566
567
568
569
569
570
571
572
573
574
575
576
577
578
579
579
580
581
582
583
584
585
586
587
588
589
589
590
591
592
593
594
595
596
597
598
599
599
600
601
602
603
604
605
606
607
608
609
609
610
611
612
613
614
615
616
617
618
619
619
620
621
622
623
624
625
626
627
628
629
629
630
631
632
633
634
635
636
637
638
639
639
640
641
642
643
644
645
646
647
648
649
649
650
651
652
653
654
655
656
657
658
659
659
660
661
662
663
664
665
666
667
668
669
669
670
671
672
673
674
675
676
677
678
679
679
680
681
682
683
684
685
686
687
688
689
689
690
691
692
693
694
695
696
697
697
698
699
699
700
701
702
703
704
705
706
707
708
709
709
710
711
712
713
714
715
716
717
717
718
719
719
720
721
722
723
724
725
726
727
728
729
729
730
731
732
733
734
735
736
737
738
739
739
740
741
742
743
744
745
746
747
748
749
749
750
751
752
753
754
755
756
757
758
759
759
760
761
762
763
764
765
766
767
768
769
769
770
771
772
773
774
775
776
777
778
779
779
780
781
782
783
784
785
786
787
788
789
789
790
791
792
793
794
795
796
797
798
799
799
800
801
802
803
804
805
806
807
808
809
809
810
811
812
813
814
815
816
817
818
819
819
820
821
822
823
824
825
826
827
828
829
829
830
831
832
833
834
835
836
837
838
839
839
840
841
842
843
844
845
846
847
848
849
849
850
851
852
853
854
855
856
857
858
859
859
860
861
862
863
864
865
866
867
868
869
869
870
871
872
873
874
875
876
877
878
879
879
880
881
882
883
884
885
886
887
888
889
889
890
891
892
893
894
895
896
897
898
898
899
899
900
901
902
903
904
905
906
907
908
909
909
910
911
912
913
914
915
916
917
918
919
919
920
921
922
923
924
925
926
927
928
929
929
930
931
932
933
934
935
936
937
938
939
939
940
941
942
943
944
945
946
947
948
949
949
950
951
952
953
954
955
956
957
958
959
959
960
961
962
963
964
965
966
967
968
969
969
970
971
972
973
974
975
976
977
978
979
979
980
981
982
983
984
985
986
987
987
988
989
989
990
991
992
993
994
995
996
997
998
999
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1097
1098
1099
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1188
1189
1190
1191
1192
1193
1194
1195
1195
1196
1197
1198
1199
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1209
1210
1211
1212
1213
1214
1215
1216
1217
1217
1218
1219
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1288
1289
1290
1291
1292
1293
1294
1295
1296
1296
1297
1298
1299
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1388
1389
1390
1391
1392
1393
1394
1395
1395
1396
1397
1398
1399
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1409
1410
1411
1412
1413
1414
1415
1416
1417
1417
1418
1419
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1488
1489
1490
1491
1492
1493
1494
1495
1496
1496
1497
1498
1499
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1509
1510
1511
1512
1513
1514
1515
1516
1517
1517
1518
1519
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1597
1598
1599
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1609
1610
1611
1612
1613
1614
1615
1616
1617
1617
1618
1619
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1697
1698
1699
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1709
1710
1711
1712
1713
1714
1715
1716
1717
1717
1718
1719
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1797
1798
1799
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1809
1810
1811
1812
1813
1814
1815
1816
1817
1817
1818
1819
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1897
1898
1899
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1909
1910
1911
1912
1913
1914
1915
1916
1917
1917
1918
1919
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2097
2098
2099
2099
2100
2101
2102
2103
2104
2105
2106
2107
2
```

### 3.8.3 Database

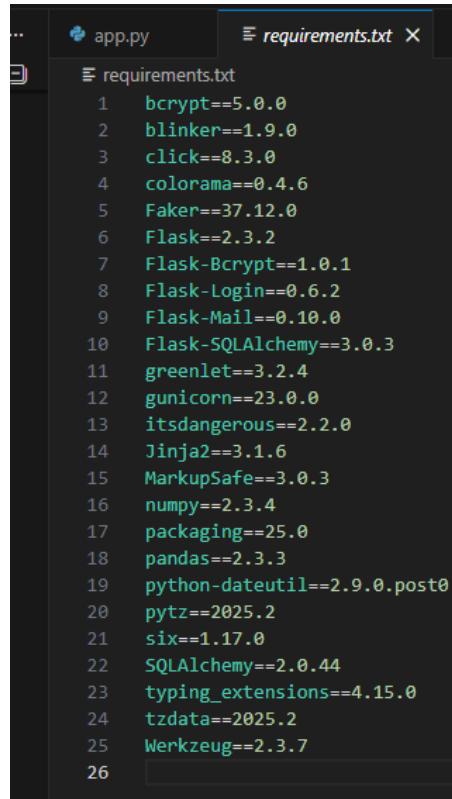


The screenshot shows a SQLite database browser interface with multiple tabs open. The active tab is 'moepysql' which contains the SQL code for creating the 'user' table and inserting 14 sample user records. The table structure includes fields like id, fullname, email, password\_hash, is\_admin, created\_at, role, organization, student\_number, department, institution\_type, mentor\_id, and two\_factor\_secret. Primary key constraints and foreign key relationships are also defined.

```
CREATE TABLE user (
    id INTEGER NOT NULL,
    fullname VARCHAR(150) NOT NULL,
    email VARCHAR(150) NOT NULL,
    password_hash VARCHAR(256) NOT NULL,
    is_admin BOOLEAN,
    created_at DATETIME,
    role VARCHAR(50) NOT NULL,
    organization VARCHAR(100) NOT NULL,
    student_number VARCHAR(50),
    department VARCHAR(100),
    institution_type VARCHAR(100),
    mentor_id INTEGER,
    two_factor_secret VARCHAR(16),
    PRIMARY KEY (id),
    UNIQUE (email),
    FOREIGN KEY(mentor_id) REFERENCES user (id)
);
INSERT INTO user VALUES(1,'System Administrator','support@tekete.co.za','pbkdf2:sha256:600000$HNLjQABto9zN');
INSERT INTO user VALUES(2,'mr mabasa','221648380@edu.vut.ac.za','pbkdf2:sha256:600000$FUxS00ZqkdaqS88D$a4e2');
INSERT INTO user VALUES(3,'L ROOS','coordinator@vut.ac.za','pbkdf2:sha256:600000$PXEdoD17jQeG4yo$6e3a4111a');
INSERT INTO user VALUES(4,'carlos','carlos@tut.ac.za','pbkdf2:sha256:600000$nnG38K9yCsAGnwbA$4a0312859f95a4');
INSERT INTO user VALUES(5,'tshidiso masoeu','tshidiso.masoeu@tekete.co.za','pbkdf2:sha256:600000$FqQQ6BpEcF');
INSERT INTO user VALUES(6,'sinethemba khobeni','sinethemba.khobeni@tekete.co.za','pbkdf2:sha256:600000$tpuU');
INSERT INTO user VALUES(7,'Codnell Chabalala','codnell.chabalala@tekete.co.za','pbkdf2:sha256:600000$6c3FFN');
INSERT INTO user VALUES(8,'naledi nkgori','naledi.nkgodi@tekete.co.za','pbkdf2:sha256:600000$w6v9UuzgfkBMWP');
INSERT INTO user VALUES(9,'sandile sibundeni','sandile.sibundeni@tekete.co.za','pbkdf2:sha256:600000$QCxu0');
INSERT INTO user VALUES(10,'thando nkuna','thando.nkuna@tekete.co.za','pbkdf2:sha256:600000$dcK11If3qdiaEIE');
INSERT INTO user VALUES(11,'fortune mathebula','fortune.mathebula@tekete.co.za','pbkdf2:sha256:600000$qcaPY');
INSERT INTO user VALUES(12,'neria Rampai','neria.rampai@tekete.co.za','pbkdf2:sha256:600000$0EWHezjICaQ9AA42');
INSERT INTO user VALUES(13,'shudufhadzo matsila','shudufhadzo.matsila@tekete.co.za','pbkdf2:sha256:600000$k');
-- INSERT INTO user VALUES(14,'masego molefe','masego.molefe@tekete.co.za','pbkdf2:sha256:600000$OpZwrrVtqdLcy');
```

Figure 11:Database

### 3.8.4 Requirements



The screenshot shows a code editor with an open file named 'requirements.txt'. The file lists a series of Python package dependencies with their specific versions. The packages include bcrypt, blinker, click, colorama, Faker, Flask, Flask-Bcrypt, Flask-Login, Flask-Mail, Flask-SQLAlchemy, greenlet, gunicorn, itsdangerous, Jinja2, MarkupSafe, numpy, packaging, pandas, python-dateutil, pytz, six, SQLAlchemy, typing\_extensions, tzdata, and Werkzeug.

```
bcrypt==5.0.0
blinker==1.9.0
click==8.3.0
colorama==0.4.6
Faker==37.12.0
Flask==2.3.2
Flask-Bcrypt==1.0.1
Flask-Login==0.6.2
Flask-Mail==0.10.0
Flask-SQLAlchemy==3.0.3
greenlet==3.2.4
gunicorn==23.0.0
itsdangerous==2.2.0
Jinja2==3.1.6
MarkupSafe==3.0.3
numpy==2.3.4
packaging==25.0
pandas==2.3.3
python-dateutil==2.9.0.post0
pytz==2025.2
six==1.17.0
SQLAlchemy==2.0.44
typing_extensions==4.15.0
tzdata==2025.2
Werkzeug==2.3.7
```

Figure 12:Requirements

### **3.9 Summary**

This chapter presented the methodology used in the development of the Moepi Check-In System. It explained the research design, data collection and analysis methods, system development processes, and the technologies used to create the platform. The chapter also illustrated how data is presented through dashboards and tables, supporting efficient monitoring of WIL student activities. The next chapter will present conclusion and recommendations.

## **Chapter 4: Findings**

### **4.1 Introduction**

This chapter presents the findings of the WIL Check-In System project. It highlights what has been achieved through the development and implementation of the system, evaluates its impact, and provides recommendations for improving WIL monitoring. The chapter also identifies potential areas for further research.

### **4.2 Summary of main findings**

The project successfully developed a secure, web-based Check-In System for monitoring students during Work-Integrated Learning (WIL) programs. The system allows students to record daily attendance, upload logbooks, and submit monthly timesheets digitally. Mentors, WIL coordinators, and SETA administrators can monitor these activities in real time through interactive dashboards.

The system improves data accuracy and security by storing all records in a MySQL database, reducing errors and the risk of lost information. Its user-friendly interface ensures that all users, whether on-site or remote, can easily navigate and use the platform without difficulty. This makes daily monitoring and reporting more efficient than traditional manual methods.

Overall, the Check-In System enhances efficiency, accountability, and reliability in WIL programs. It reduces administrative workload, ensures accurate records, and helps institutions make informed decisions regarding student progress, supervision, and compliance. By integrating digital attendance, logbook submission, and timesheet management into one platform, the system improves the overall quality of workplace learning.

### **4.3 Recommendations**

Based on the findings of this study, it is recommended that the Check-In System be fully adopted across all departments to replace traditional paper-based attendance tracking and manual reporting. To ensure proper use and maximize the benefits of the system, training sessions should be provided for students, mentors, and administrators. Regular system updates and maintenance are also important to maintain security, efficiency, and scalability as more users access the platform. Additionally, a feedback mechanism should be established to allow users to suggest

improvements and report any issues they encounter. Finally, the institution should consider integrating the Check-In System with other existing software to create a unified platform for student management, further enhancing efficiency and ease of monitoring.

#### **4.4. Further Research**

- Developing a mobile application version of the Check-In System for easier access on smartphones and tablets.
- Integrating advanced analytics to identify trends in student performance and predict areas of improvement.
- Investigating AI-based verification of logbooks and timesheets to automate evaluation.
- Exploring the integration of biometric attendance systems to enhance security and accuracy.
- Studying the impact of real-time notifications and alerts on student engagement and compliance during WIL programs.

## REFERENCES

- Adeyemi, T., 2020. Challenges in implementing digital attendance monitoring systems in educational institutions. Lagos: University Press.
- Alavi, M. & Leidner, D.E., 2001. Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 25(1), pp.107–136.
- Bates, A.W., 2019. Teaching in a digital age: Guidelines for designing teaching and learning. 2nd ed. Vancouver: Tony Bates Associates Ltd.
- Brown, J., 2021. Web-based learning and monitoring platforms: An overview of efficiency and adoption challenges. *Journal of Educational Technology*, 18(3), pp.45–59.
- Nkosi, P., 2019. Manual attendance tracking in Work-Integrated Learning: Issues and solutions. Johannesburg: EduTech Publishers.
- Patel, R. & Kumar, S., 2021. Digital solutions for student monitoring: A study of online check-in systems. Cape Town: Academic Press.
- Rogers, E.M., 2003. Diffusion of innovations. 5th ed. New York: Free Press.
- Smith, J. & Jones, L., 2020. Attendance and accountability in Work-Integrated Learning programs. London: Routledge.
- Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D., 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), pp.425–478.
- Adepoju, T., 2018. Security challenges in web-based student management systems. *International Journal of Computer Applications*, 182(25), pp.1–7.
- Johnson, L., Becker, S.A., Estrada, V. & Freeman, A., 2014. NMC Horizon Report: 2014 Higher Education Edition. Austin, Texas: The New Media Consortium.
- Kumar, R., 2016. Research methodology: A step-by-step guide for beginners. 4th ed. London: SAGE Publications.