

NWU LIVE POLL



PROJECT DOCUMENTATION

Real-Time Classroom Polling System
Institutional Project 2025

NWU Live Poll is a full-stack, real-time classroom polling system built for North-West University. Lecturers create timed quizzes and polls; students join instantly via a 6-character session code from any browser — no installation required. Live statistics, automatic grading, and CSV export make it a complete institutional assessment tool aligned with POPIA compliance requirements.

■ Real-Time

■ Secure

■ Analytics

■ Any Device

■ POPIA Safe

7

Team Members

3–5

Questions/Poll

6-char

Join Code

CSV

Export

PROJECT TEAM · GROUP 1

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NWU Live Poll – Project Summary

Group 1 · North-West University · Institutional Project 2025

1. Overview & Mission

NWU Live Poll is a production-ready, full-stack real-time classroom polling platform developed to replace commercial polling solutions at North-West University. The system enables lecturers to create timed multiple-choice polls and quizzes which students join instantly from any web browser using a unique 6-character session code — no software installation needed. Live response tracking, automatic grading, attendance monitoring, and CSV export make it a complete formative-assessment tool aligned with POPIA data-privacy requirements.

Mission: Make learning interactive by providing a simple live-polling platform for every NWU classroom.

2. Primary Objectives & Success Indicators

- **Interactive Learning:** Support 100+ concurrent students in real-time sessions
- **Instant Feedback:** Automatic grading and immediate per-question results
- **Data Protection:** Institutional POPIA-compliant data ownership — no third-party sharing
- **Accessibility:** Cross-device browser compatibility — phone, tablet, desktop
- **Analytics:** Detailed per-lecture performance reports and attendance tracking
- **Scalability:** Multiple simultaneous classroom sessions supported
- **Cost Reduction:** Eliminates recurring commercial licensing fees

3. Core System Modules

Lecturer Module

Create polls (3–5 questions, 4 options each) · Set timers & optional security codes · Generate unique 6-char join code · Monitor live lobby · Real-time per-question stats (green=correct, red=wrong, grey=unanswered) · End session manually or on timeout · Export to CSV

Student Module

Sign up with student number + email · Join poll using code + optional security code · Waiting lobby until lecturer starts · Timed multiple-choice interface · Auto-submit on timeout · Immediate score & per-question feedback · Historical poll results stored in dashboard

4. How It Works – Session Lifecycle

- 1 Lecturer registers / signs in → opens dashboard → clicks 'Create a new poll'
- 2 Configures title, timer (minutes), optional security code, 3–5 questions with 4 options, marks correct answer
- 3 Clicks 'Create poll' → poll appears in 'Your polls' list → clicks 'Open for joining'
- 4 Students: 'Student' tab → sign in → 'Join a poll' → enter join code + optional security code → waiting lobby
- 5 Lecturer sees joined students in lobby (can kick unwanted) → clicks 'Start poll'
- 6 Questions delivered simultaneously; timer runs; real-time charts visible only to lecturer
- 7 Quiz ends (timeout or manual) → students see scores + per-question breakdown → lecturer exports CSV

5. Technology Stack & Deployment

Frontend:

React 18 · TypeScript · Vite · Tailwind CSS · ShadCN UI · Socket.IO Client

Backend:

Node.js · Express.js · TypeScript · Prisma ORM · JWT Auth · Socket.IO · Redis

Database:

PostgreSQL hosted on Neon.tech · Redis for session caching

DevOps:

Docker · Docker Compose · Vercel (frontend) · GitHub Actions CI/CD

6. Project Links & Resources

Live Application: <https://nwu-live-poll-web.vercel.app>

Source Code: <https://github.com/SlothCartel/NWU-Classroom-Polling-Group-1>

Backend API: <https://zsn02j9r-8080.inc1.devtnnels.ms/api>

eFundi Page: <https://efundi.nwu.ac.za>

User Guide – Functional Overview

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Mission & Vision

Mission: Make learning interactive by providing lecturers and students a simple live-polling platform for real-time participation and instant feedback.

Vision: Build a trusted institutional polling tool that improves participation, communication, and feedback in every NWU classroom through technology.

Student Workflow

Sign Up: Click 'Student' on home page → sign up with full name, student number, NWU email, and password (min 6 chars) → redirected to home.

Sign In: Enter student number and password → directed to 'Join' dashboard showing previous poll history and results.

Join Poll: Click 'Join a poll' → enter the 6-char join code given by lecturer + optional security code → placed into waiting lobby.

In Session: Timer-based questions appear one at a time. Must submit before timer runs out. Unanswered questions auto-submit as incorrect.

Results: Immediate score (e.g. 2/3) plus per-question breakdown shown. Completed polls appear in history — can be reviewed or deleted.

Lecturer Workflow

Sign Up/In: Click 'Lecturer' on home → sign in with university email and password, or create a new account.

Create Poll: Left panel: set title, timer (minutes), optional security code, add 3–5 questions each with 4 options. Blue dot = correct answer.

Open Session: Click 'Create poll' → poll listed in 'Your polls' → click 'Open for joining' → share join code (and security code if set) with class.

Run Session: View lobby → kick unwanted students → 'Start poll'. Charts update live per question (green=correct, red=wrong, grey=unanswered).

End & Export: Session ends on timeout or by manual 'End'. 'Export to CSV' downloads a timestamped .csv file openable in Microsoft Excel.

Post-Session: Click 'Stats' from dashboard at any time to review or re-download historical poll analytics and per-student performance.

Security & Privacy

Authentication: JWT-based sessions with bcrypt password hashing. Password minimum 6 characters enforced at registration.

Access Control: Optional security codes restrict poll joining to in-class students only. Lecturer can kick participants from lobby.

POPIA: Full institutional data ownership — no third-party commercial platform. Student data minimised and stored securely.

Infrastructure: PostgreSQL on Neon.tech · Redis caching · Vercel frontend hosting · All traffic over HTTPS · GitHub Actions CI/CD.