

Transforming Offline Exams into a Digital CBT Ecosystem With PrepAI

In 2024, the Kwame Nkrumah University of Science and Technology (KNUST), College of Health Sciences (CHS), launched a large-scale digital transformation initiative to shift all written examinations into a Computer-Based Testing (CBT) model. While the institution successfully deployed a CBT delivery platform, a critical challenge emerged: **faculty struggled to migrate decades of offline question banks and create new CBT-ready assessments efficiently.**

To bridge this gap, KNUST partnered with **PrepAI** to digitize question banks, standardize assessments, and train faculty to confidently create and manage digital exams.

Quick Snapshot

Client: KNUST College of Health Sciences

Location: Ghana

Sector: Higher Education – Medical & Health Sciences

Goal: Transform offline written exams into a fully digital CBT format.

Solution: PrepAI-led multi-stage training, question bank digitization & AI-enabled exam creation

Faculty Trained: 68 instructors across Medicine, Dentistry, Pharmacy, Nursing, Allied Health & Public Health

The Challenges

Challenge 1: Fragmented, Offline Question Banks

At KNUST University, faculty members have been saving exam questions across Word files, PDFs, handwritten notebooks, and email threads. It becomes difficult for the professors to retrieve past exam items, maintain consistency, or ensure version control. In case of exams, professors need to spend significant time searching for old files or rewriting questions for exams. Thus, they had to focus on assessment generation, reducing their time for teaching.

Challenge 2: Limited Familiarity with Digital Exam Creation

Although professors were deeply proficient in their subject domains. The faculty at KNUST university had limited exposure to creating digital, CBT-ready assessments. Faculty were unsure how to structure questions for online tests, tag difficulty levels, or format assessments for the new CBT system. These manual tasks and skill gaps reduced confidence in the new system and contributed to low early adoption rates of the CBT platform.

Challenge 3: No Standardization for Learning Outcomes or Difficulty Levels

Across departments at KNUST University, there was no consistent mapping of questions to learning outcomes, Bloom's taxonomy, or competency levels expected from students. This led to wide variations in exam difficulty, gaps in curriculum alignment, and inconsistencies in how student performance was measured.

Challenge 4: Time-Intensive Question Bank Creation

Creating new question banks or updating existing ones was a lengthy manual process. The faculty spent 4-6 hours typing questions into Word, formatting answer choices, adjusting phrasing, and proofreading for errors. This workload increased significantly during peak exam periods, often spilling into evenings and weekends. The repetitive nature of this task reduced time available for research, mentorship, and lesson planning, making assessment creation one of the most burdensome parts of the academic workflow.

Challenge 5: No Central Repository for Departmental Question Banks

Every professor at the KNUST University maintained personal copies of their own question sets, resulting in silos within departments. There was no shared repository for creating, reviewing, or improving departmental exam content. This lack of centralized storage led to duplication of effort, inconsistencies in question quality, limited collaboration across faculty, and the inability to reuse content efficiently. Without a unified digital question bank, KNUST could not scale its CBT initiative or maintain long-term exam integrity.

The Solution

As KNUST College of Health Sciences began transitioning from paper-based exams to a digital Computer-Based Testing (CBT) ecosystem, the university quickly realized that technology alone could not solve its assessment challenges. The real barriers were deeply embedded in the academic workflow, scattered question banks, non-standardized content, limited digital literacy, and significant faculty time spent on manual exam preparation.

With PrepAI these challenges quickly got resolved:

Centralizing Question Banks at KNUST

Faculty at KNUST College of Health Sciences stored exam questions across Word files, PDFs, email attachments, and handwritten notebooks. This all required huge manual effort; thus, fragmentation slowed down the transition to CBT and made it difficult to maintain consistency across departments. After the Integration of PrepAI:

- **Instant Question Extraction:** Professors uploaded their Word/PDF files, and PrepAI automatically converted them into clean, structured digital question banks.

- **Unified Digital Repository:** All departments at KNUST now access a centralized, organized exam library, improving collaboration and institutional knowledge retention.

Training Faculty to Build CBT-Ready Exams

Most professors at KNUST had limited experience creating digital assessments aligned with CBT requirements. They were unsure how to format questions, structure answer choices, or create digitally compatible exam files. After working with PrepAI:

- **Hands-On Digital Exam Creation:** Faculty learned to generate MCQs, HOTS, and case-based questions for different types of learners directly inside PrepAI.
- **CBT-Compatible Exports:** Professors built assessments and exported them in formats fully compatible with KNUST's CBT system, ensuring smooth digital delivery.

Standardizing Learning Outcomes & Difficulty Levels

Assessments across KNUST departments varied in quality, structure, and difficulty. Questions were not mapped to learning outcomes, competencies, or Bloom's levels, creating inconsistencies in exam standards and student evaluation. After PrepAI implementation:

- **Automated Tagging:** PrepAI mapped each question to learning outcomes, Bloom's taxonomy, and difficulty tiers automatically.
- **Balanced Exam Design:** Faculty-generated exams with consistent difficulty and competency alignment, strengthening assessment fairness across KNUST programs.

Automating Question Generation for Time Savings

Creating or updating a question bank required 4–6 hours per assessment. Faculty had to type each question manually, format options, proofread, and ensure alignment with course outcomes. This workload became overwhelming during exam cycles, and after PrepAI integration, professors were able to draft:

- **AI-Generated Question Sets:** Instructors generated large volumes of questions from course notes, textbooks, and uploaded PDFs within minutes.
- **Significant Time Savings:** Exam creation time reduced by 75–85%, allowing KNUST faculty to focus on research, student engagement, and clinical duties.

Shared Departmental Question Repositories

Each lecturer maintained personal question files with no shared departmental system. This caused duplication of work and made it difficult to maintain high-quality, reusable question banks across the College of Health Sciences. With the help of PrepAI:

- **Shared Departmental Libraries:** The AI assessment generator enabled the Medicine, Nursing, Pharmacy, and Allied Health departments to collaboratively build and maintain digital question repositories.
- **Improved Collaboration:** Faculties now work together to refine, update, and standardize exam content, ensuring long-term scalability and CBT readiness.

Implementation & Training: How PrepAI Rolled Out Everything Effectively?

To ensure a smooth transition from paper-based assessments to a fully digital CBT ecosystem, PrepAI followed a structured, multi-phase implementation plan tailored to the needs of the KNUST College of Health Sciences. Each stage focused on building faculty capability, digitizing academic content, and aligning exam workflows with the CBT platform.

Onboarding, Curriculum Audit & Content Mapping

Before introducing PrepAI, a detailed audit was conducted to understand KNUST's existing assessment landscape across Medicine, Dentistry, Pharmacy, Nursing, Public Health, and Allied Health.

- Reviewed departmental exam formats and structure
- Identified all question sources: Word documents, PDFs, printed files, and handwritten notebooks
- Mapped academic content to learning outcomes and CBT requirements
- Assessed digital readiness and departmental challenges

Multi-Stage Training & Hands-On Faculty Workshops

Recognizing that many instructors were new to digital exam creation, PrepAI delivered a comprehensive training program focused on practical, real-world usage.

Training Delivered:

- **4 live, hands-on workshops** conducted between August and October 2024
- **2 follow-up troubleshooting clinics** for advanced support
- **68 instructors trained** across all CHS departments

Establishing Centralized Digital Repositories

Once faculty were trained, PrepAI supported KNUST in building department-level digital repositories to ensure consistency and long-term sustainability.

- Created shared digital question banks for each department
- Migrated thousands of legacy questions into structured repositories

- Assigned departmental “content owners” for ongoing updates
- Introduced standard tagging and review guidelines

CBT Integration, Testing & Final Alignment

The final step ensured that PrepAI-generated assessments flowed seamlessly into KNUST’s existing CBT delivery platform.

- Standardized PrepAI export templates to match CBT input requirements
- Conducted integration testing with exam administrators
- Finalized exam templates for semester-wide CBT deployment

The Results

75–85% Faster Question Bank Digitization

Before PrepAI, digitizing 100 questions required **7–10 hours** of manual typing and formatting. After automated upload and extraction, the same task now takes **under 15 minutes**. Over six weeks, KNUST digitized **8,400+ questions**, with **87% auto-tagged**, which helped them in:

- Eliminate repetitive manual typing and formatting
- Access a clean, centralized digital repository anytime
- Preserve decades of academic content without rework

92% Faculty Adoption of Digital Exam Creation

Adoption was initially low due to unfamiliarity with digital workflows. After multi-stage hands-on training, **92% of trained instructors created at least one test** on PrepAI within 30 days, and **41 instructors** now manage shared departmental question banks.

- Build unified, standardized question banks collaboratively
- Reduce dependency on personal files and inconsistent formats
- Establish long-term digital assessment ownership

60–70% Faster Exam Compilation & Delivery

Previously, compiling a final exam took **12+ hours** of formatting, proofreading, and administrative follow-up. With PrepAI and the CBT system, final exams are now created and ready in **45 minutes**, with near-zero formatting issues. As a result, departments experienced:

- More accurate, error-free exam papers (error rate down from 6.8% to <0.5%)
- Smoother coordination with exam offices and administrators
- More reliable and secure digital exam delivery

Significant Reduction in Operational Costs

KNUST previously spent **\$8,600+ per semester** on printing, paper logistics, and invigilation for large-scale exams. The shift to digital delivery eliminated most of these expenses. This cost transformation allowed the university to:

- Reduce long-term operational overhead
- Allocate budget toward digital readiness and academic tools
- Improve sustainability by minimizing printing and storage needs

Why AI Is Essential for Modern University Assessments

After implementing PrepAI, we have received feedback from KNUST university:

“PrepAI reduced our item-writing time by more than 70%. Now we can align questions to competencies instead of spending hours formatting.” — Dr. Ama Boateng, Exam Committee

Member, Department of Nursing “The ability to import previous questions and instantly restructure them saved us weeks of preparation.” — Prof. Osei Mensah, Faculty of Pharmacy

As KNUST CHS scaled its CBT initiatives, traditional manual workflows, typing questions, formatting exams, and organizing banks became slow, inconsistent, and unsustainable.

Schedule your Faculty AI Readiness Workshop today and empower your educators with AI-driven excellence in assessment.

[Schedule your Workshop today](#)