

AssessReview AI (ARAI)

Documentation & User Guide

Release Date: September 2026 | Application Version: 3.0
Platform: Universal HTML5 / JavaScript — Client-Side · Gemini AI-Powered

Central principle

Exam quality review should be consistent, transparent, and evidence-based. ARAI helps assessment leads apply a structured, documented quality check to every examination — it does not replace professional academic judgement or institutional authority.

1. Introduction

AssessReview AI (ARAI) is a browser-based, AI-powered quality assurance tool developed for the College of Pharmacy at Gulf Medical University. It automates the peer-review process for ExamSoft examination files, applying 21 standardised assessment-quality criteria aligned with the QF Emirates National Qualifications Framework.

Unlike a manual checklist, ARAI re-evaluates its findings in real time as you upload different files. This allows reviewers to check alternative versions and understand exactly why a defect is reported.

Key features

1. **21-criterion AI analysis:** Checks language clarity, Bloom's taxonomy alignment, blueprint coverage, option design, clinical accuracy, and more.
2. **Direct PDF reading for CLO/PLO/Bloom's:** Sends the exam PDF natively to Gemini to read the Item Categories table — eliminating false positives from text extraction.
3. **Word-by-word similarity detection:** Jaccard similarity at $\geq 95\%$ threshold flags reused items against previous exams, reporting the exact Item ID of the match.
4. **Model cascade:** Automatically tries up to 8 Gemini models in order — if one is overloaded it falls back to the next without user intervention.
5. **Structured Word export:** Produces a formatted Assessment Review Report (.docx) that exactly mirrors the on-screen layout.
6. **Session restore:** Completed reviews are saved in the browser and can be restored on the same device.
7. **Zero server storage:** All processing happens in the user's browser — no exam data is stored on any server.
8. **Responsive design:** Fully functional on desktop, tablet, and mobile screens.

Professional review required

The ARAI Defect Report is a structured decision-support output, not a validated psychometric instrument. All AI-generated defects must be reviewed and confirmed by a qualified academic before any action is taken.

2. System Requirements

Browser and device

- Modern desktop browser: Chrome 110+, Edge 110+, Firefox 115+, Safari 16.4+
- Mobile / tablet: Chrome for Android, Safari for iOS (tablet recommended)
- JavaScript must be enabled; minimum screen width 320 px
- Active internet connection required during analysis (API calls and CDN libraries)

Google Gemini API key

Required: Gemini API key

Obtain a free key from **Google AI Studio** at aistudio.google.com/app/apikey. ARAI does not include an API key. The free tier supports most review sessions.

Supported file formats

FILE TYPE	EXTENSION	NOTES
ExamSoft Export PDF	.pdf	Recommended. Enables Gemini native PDF reading for CLO/PLO/Bloom's verification.
Word Document	.docx	CLO/PLO/Bloom's falls back to JavaScript text search.
Excel Spreadsheet	.xlsx	Supported for blueprint files.

3. Getting Started — Step-by-Step Workflow

Step 1 • API key setup

1

Go to Google AI Studio

Navigate to aistudio.google.com/app/apikey and sign in with a Google account.

2

Create API Key

Click **Create API Key**. Copy the key. Keep it confidential — treat it like a password.

3

Paste into ARAI

On the AI Configuration screen, paste the key and click **Test Connection**, then **Connect & Continue**.

Step 2 • Assessment information

Fill in all required fields: Course Name, Course Code, Program, Semester, Coordinator, Reviewer, Assessment Element, QF Emirates Level, and Offering Type (First or Repeated).

Offering type matters

Selecting *First Offering* disables the Previous Exams upload zone and marks Similarity as N/A. Select *Repeated Offering* when previous exam files are available.

Step 3 • Document upload

ZONE	FILES	PURPOSE
A. Exam Blueprint	Single file (required)	Verifies blueprint coverage and Bloom's distribution
B. Current Examination	Multiple files (required)	The ExamSoft PDF export(s) to be reviewed
C. Previous Exams	Multiple files (optional)	Used for item reuse / similarity analysis

Step 4 • Run analysis

Click **Start Assessment Review**. The analysis runs in three phases:

1. **Text extraction (0–45%)** — PDF.js extracts text from all uploaded files.
2. **CLO/PLO/Bloom's check (45–50%)** — Each current exam PDF is sent directly to Gemini as binary data for native Item Categories table reading.
3. **AI quality analysis (50–97%)** — All 21 criteria are evaluated; similarity against previous exams is computed.

4. Assessment Review Criteria

ARAI applies 21 standardised criteria to every question. Each carries a severity level.

Severity definitions

Critical — Must be resolved before the exam can be administered. **Major** — Significant quality concern; resolution strongly recommended. **Minor** — Advisory; low risk but worth improving.

#	CRITERION	SEVERITY	WHAT IS CHECKED
1	QF Emirates Alignment	MAJOR	Cognitive demand matches the QF Emirates level selected for the course
2	Bloom's Taxonomy Level	MAJOR	Stem tests the declared Bloom's level; flags under/over-targeting
3	CLO / PLO / Bloom's Mapping	MAJOR	CLO, PLO, and Bloom's all present in Item Categories (Gemini PDF reader + JavaScript)
4	Blueprint Coverage	MAJOR	Topic distribution matches the uploaded exam blueprint
5	Bloom's Distribution Balance	MINOR	Flags over-concentration at a single Bloom's level across the exam
6	None / All of the Above	MAJOR	Detects discouraged option types (only if phrase present in text)
7	All Except / All But	MAJOR	Detects "all except" / "all but" constructions
8	True / False Items	MAJOR	Identifies T/F questions not permitted in MCQ format
9	Answer Key Distribution	MINOR	Flags abnormal concentration of a single answer key (> 40%)
10	Vague Quantifiers	MINOR	Flags "usually", "sometimes", "rarely", "few", "many" in stems
11	Window Dressing	MINOR	Excessive irrelevant clinical narrative that doesn't contribute to the question
12	Stem Length Consistency	MINOR	Stem is excessively brief (< 8 words) or long (> 80 words)
13	Homogeneity of Options	MAJOR	Options are not plausible distractors of the same type / category

14	Cluing / Cueing	MAJOR	Grammatical or content clues in the stem that reveal the correct answer
15	Convergence Clue	MAJOR	One option is a superset or combination of others
16	Implausible Distractors	MAJOR	Options are obviously incorrect or unrelated to the domain
17	INN / Generic Drug Names	MAJOR	Brand/trade names detected; correct INN equivalent suggested
18	Parallel Grammatical Structure	MINOR	All options must use the same grammatical form
19	Absolute Terms	MINOR	Flags "always", "never", "only", "must" as potential cueing words
20	Negative Stem Format	MINOR	Flags "NOT", "EXCEPT", "LEAST likely" stems (advisory)
21	Item Reuse / Similarity	CRITICAL	Jaccard word-by-word similarity $\geq 95\%$ vs. previous exams; reports exact Item ID of match

5. Similarity Analysis

When previous exam files are uploaded, ARAI performs a word-by-word Jaccard similarity comparison between every current question and every question in all previous exam files.

Jaccard similarity formula

$$\text{Jaccard}(A, B) = |A \cap B| / |A \cup B|$$

Stop words removed before comparison: *the, a, an, is, are, of, in, for, to, with, that, this, it, be, as, at, by, from, on, or, and, but*. A score ≥ 0.95 (95.00%) triggers a **[Critical]** Item Reuse defect.

Previous Exam Reference — Item ID

The Similarity Report table's *Previous Exam Reference* column shows the actual **Item ID** from the "Item ID:" field in the matching previous exam question (e.g. EndSemesterJanCohortMCQ.pdf — Item ID: 637603 / 1), not a sequential question number.

6. CLO / PLO / Bloom's Detection

Criterion 3 uses a two-phase approach that bypasses AI inference entirely, eliminating false positives:

1. **Primary — Gemini native PDF reading:** The exam PDF is sent as base64 binary to Gemini, which reads the two-column Item Categories table natively and returns {hasCLO, hasPLO, hasBloom, absent} per item.
2. **Fallback — JavaScript text search:** If the PDF read fails, JavaScript performs phrase searches (.includes('CLO'), .includes('PLO'), .includes('bloom')) on the extracted text.
3. **Defect generation in JavaScript:** Defect objects are created in code — not by the AI — to prevent duplicates.

7. Review Results & Report

Review Summary strip

Four statistics are shown at the top of the results page: **Questions** · **Total Defects** · **Similar Items** · **Similarity %**

Defect Report table

COLUMN	CONTENT	EDITABLE?
Item ID / File	Question Item ID and source exam filename	No
Remarks	AI-generated defect description	Yes
Actions	Save · Reset · Delete per defect	—

Filters

Category filter (drop-down) and free-text search filter the defect table in real time.

8. Export to Word

Click **Export Word** to download a .docx file. The exported document mirrors the on-screen report: title, subtitle, per-file similarity line, Course Information, Review Summary, Similarity Analysis table, Defect Report table, Overall Review Comments.

File naming: ProgramName_CourseCode_Semester.docx — e.g. BPharm_BIS101_Fall_2026.docx

Download in iframe / Wix

When embedded in a Wix widget or iframe the Word file may open in a new browser tab rather than downloading directly. Use the browser's Save As option from that tab.

9. Session Save & Restore

ARAI automatically saves the session to browser local storage on every edit. On re-opening, a banner offers to restore the last session. Autosave is silently disabled in private/incognito windows or when local storage is blocked by the browser.

10. Technical Specifications and Deployment

Technology stack

COMPONENT	TECHNOLOGY
AI engine	Google Gemini API — model cascade up to 8 models (flash models prioritised)
PDF parsing	PDF.js (Mozilla, v2.16.105) for text; Gemini native read for CLO/PLO/Bloom's
Word export	docx.js v7.8.2 (client-side)
Deployment unit	Single self-contained HTML file (~92 KB) — no installation or backend
Styling	Tailwind CSS (play CDN) + Font Awesome 6.4
Storage	Browser localStorage only — no server-side data

Cloudflare Pages deployment

1

Create a Cloudflare Pages project

Log in to dash.cloudflare.com → Workers & Pages → Create → Direct Upload.

2

Upload the HTML file

Rename ARAI_AssessReview_AI_v3.0.html to index.html and upload it.

3

Share the URL

The tool is instantly accessible at the generated *.pages.dev URL.

Wix HTML widget embedding

1

Add an HTML Component

In the Wix Editor → + → Embed Code → HTML iframe.

2

Paste the full source code

Open ARAI_AssessReview_AI_v3.0.html, select all, paste into the HTML widget editor.

3

Set size

Set component height ≥ 900 px, width 100%, scrolling enabled.

11. Mobile and Tablet Operation

ARAI v3.0 includes responsive CSS for mobile and tablet screens:

- Nav subtitle and model name hidden on screens < 640 px to prevent overflow
- Stat cards wrap to a 2-per-row grid on mobile and tablet
- Tables use horizontal scroll containers — the page body never scrolls sideways
- Minimum touch target size ensured for all interactive controls

12. Privacy, Security and Data Handling

Privacy-by-design architecture

- Exam question text is processed transiently by the Gemini API per Google's usage policies — it is not stored permanently by Google or by ARAI.
- API keys are held in browser session memory only and are cleared when the tab is closed.
- Session data (defects, comments) is stored in browser local storage on the reviewer's device only.
- No data is transmitted to any GMU, ARAI, or third-party server beyond the Gemini API call.

Data-entry rule

Reviewers should treat exam content as confidential and ensure their Google account and API key usage comply with institutional data governance and exam security policies.

13. Methodological Limitations and Governance

- AI models may occasionally produce false-positive or false-negative defect reports.
- Subjective criteria (window dressing, cluing) require human judgement for final determination.
- The model cascade selects the best available model; different models may produce slightly different results for the same exam.
- Similarity detection is a flagging mechanism — intent and context must be assessed by the reviewer.

Recommended governance use

Use ARAI as a first-pass automated screen to identify potential issues. All flagged defects should be independently verified by the reviewer before inclusion in the final assessment review report submitted to the Assessment Office.

14. Development and Attribution

FIELD	DETAIL
Application name	AssessReview AI (ARAI)
Version	3.0 — September 2026
Institution	College of Pharmacy - Gulf Medical University
Assessment Lead	Dr. Mohammed Abdullatif · dr.abdullatif@gmu.ac.ae
Platform	Universal HTML5 / JavaScript — Client-Side · Gemini AI-Powered
Data storage	Browser localStorage only — no server-side storage