



MCQ DOCTOR

Source-Grounded MCQ Generation & Quality Assurance Documentation & User Guide

Release: Version 5.0.1 - August 2026

Platform: Universal HTML5/JavaScript - single-file, client-side application

AI access model: Bring Your Own Key (BYOK) using a personal Google Gemini API key

Primary users: Health professions educators, assessment teams, course coordinators and faculty reviewers

1. Introduction

MCQ Doctor is a professional assessment-development application for health professions education. It combines source-grounded MCQ generation with structured review of existing questions, while keeping the final academic and clinical decision with a qualified human expert.

The application is not an autonomous examination author. It creates or analyzes editable drafts, identifies item-writing risks, records faculty decisions and blocks final exports until human expert oversight has been explicitly confirmed.

Core principle: AI assists; faculty adjudicate. Every exported bank remains the responsibility of the named reviewer.

1.1. Two operating modes

Mode	Purpose	Distinctive safeguard
Generate MCQs from Sources	Create single-best-answer MCQs, keys and explanations from uploaded documents.	Uploaded sources are the exclusive authority; a separate verification pass checks evidence and answer-key support.
Analyze and Improve MCQs	Review an existing question bank and return editable, criterion-level recommendations.	Faculty accept, reject or address each recommendation before final oversight and export.

2. User Manual

2.1. Getting Started

When MCQ Doctor opens, the API-key and privacy screen appears before either workflow can be used.

1. **Open Google AI Studio API Keys.**
2. **Sign in with a personal Gmail account.** Institutional accounts frequently restrict AI Studio or API-key creation.
3. **Create a new authorization key**, copy it and paste it into the Gemini API key field.
4. **Read and acknowledge the privacy notice**, then select Test key and continue.

Direct link: [Open Google AI Studio API Keys](#)

September 2026 API-key alert: The application deliberately retains the current warning that standard keys will be rejected from September 2026 and instructs users to create a new authorization key in Google AI Studio.

Recommended account: Use a personal Gmail account. Many institutional Google environments block AI Studio, key creation or free-tier access.

2.1.1. How the key is handled

- **The key** is sent only to Google Gemini API endpoints.
- **By default**, it remains only in the current page memory.
- **If Remember only until this browser session ends is selected**, it is stored in sessionStorage and disappears when the browser session closes.
- **The key is never included** in project backups or downloaded reports.
- **Use Change key** at any time to disconnect and enter another key.

2.1.2. Privacy acknowledgement

Do not upload identifiable patient information, student identifiers, confidential examination content that you are not authorized to process, or copyrighted documents without permission. Free-tier Gemini inputs may be used by Google to improve its products; institutional policy and applicable law remain controlling.

2.1.3. Starting or restoring work

- Choose Generate MCQs from Sources or Analyze and Improve MCQs from the workflow selection screen.
- Use Open project to restore a .mcqdoctor.json backup. Source manifests are restored, but source files must be uploaded again before another AI run.
- Use New project to clear the current working project while retaining the validated API-key session.

2.2. Mode 1 - Generate MCQs from Exclusive Sources

2.2.1. Configure the assessment blueprint

Enter the project title, program, course, learner stage, topic and learning outcomes. Then define the requested item count, options per item, cognitive target, item style, intended difficulty, language and any additional constraints.

Blueprint quality matters: Specific learning outcomes and learner level produce more defensible items than a broad topic label alone.

2.2.2. Upload approved source documents

Add one or more documents that the model is authorized to use as the exclusive factual basis for generation.

Category	Accepted formats	Processing approach
Documents	PDF, DOCX, PPTX, RTF	PDF is sent as a document part; DOCX/PPTX text and supported media are extracted in-browser; RTF text and embedded PNG/JPEG media are parsed.
Text/data	TXT, MD, HTML/HTM, JSON, CSV	Text is read locally; HTML markup is converted to visible text.
Images	PNG, JPG/JPEG	Images are sent as multimodal parts and retained as media assets for image-dependent questions.

- **Maximum individual file size:** 18 MB.
- **Maximum combined project upload:** 40 MB.
- **Legacy .doc files are not supported;** convert them to DOCX or PDF.

2.2.3. Exclusive-source contract

The generation prompt explicitly instructs Gemini that uploaded APPROVED_SOURCE parts are the only authority for assessable facts. It prohibits Google Search, URLs, general medical knowledge and unsupported assumptions from being used to supply factual content.

- Every correct answer and explanation must include source evidence.
- Evidence should identify the source ID plus a page, slide, section, paragraph or precise content locator.
- If the sources are insufficient, the model should return fewer questions with warnings rather than inventing content.
- Distractors should be anchored to source-covered alternatives or controlled misconceptions supported by the source context.

Important limitation: Prompt controls and verification substantially reduce unsupported content but do not replace expert source checking. The reviewer must verify every citation and keyed answer.

2.2.4. Generate and verify

1. Review the run summary and select Generate source-grounded MCQs.
2. The app processes questions in batches of three to improve responsiveness and free-tier reliability.
3. Gemini returns stems, options, the keyed answer, explanation, learning-outcome metadata, intended cognitive level, evidence and warnings.
4. A second, independent AI pass checks whether the key and evidence are supported, whether citations resolve to the uploaded sources and whether a multiple-correct-answer risk exists.
5. Items with unsupported evidence, ambiguous keys or verification failures are marked with blocking issues for faculty resolution.

2.2.5. Expert item review

Each generated item is fully editable. Faculty may revise the stem, options, key, explanation, media associations and override rationale. Any material change clears the previous review status and final consent.

- **Check** the exact source evidence and clinical accuracy.
- **Confirm** that one—and only one—option is defensibly correct.
- **Verify** the focused lead-in, cover-the-options test and absence of avoidable cueing.
- **Resolve** every blocking issue or document a defensible expert override.
- **Mark Reviewed** only after the final wording, answer key, explanation and media are satisfactory.

When more than one saved version exists, Restore previous version returns the item to its immediately preceding saved state. Restoring or editing requires renewed review.

2.2.6. Human expert oversight gate

Exports remain locked until every included item satisfies the review requirements. The reviewer then enters a name or initials and professional role and confirms the application's responsibility declaration.

Consent is content-bound: The application calculates a SHA-256 hash of the final included items. Any subsequent item change clears the declaration and requires renewed expert confirmation.

2.3. Mode 2 - Analyze and Improve Existing MCQs

2.3.1. Configure and upload the question bank

Enter the project context and learning outcomes, then upload the existing questions. Supported upload formats are PDF, DOCX, PPTX, RTF, TXT, MD, HTML, JSON, CSV, PNG and JPG/JPEG.

The app first attempts deterministic local parsing for JSON, Moodle Aiken text and ExamSoft-style RTF. Other files, including image-rich material and chemical structures, use Gemini extraction to preserve the stem, options, explicitly marked answer and media association.

No answer guessing during extraction: If the uploaded file does not explicitly identify the correct answer, extraction should leave the key empty. Faculty must enter or verify the answer before approval.

2.3.2. Optional reference sources

Reference documents are optional in analysis mode. Their presence changes what the report may claim:

Reference status	Permitted analysis claim
References supplied	Factual content and answer keys may be checked only against the supplied references, with evidence citations and unsupported-claim warnings.
No references supplied	The app assesses construction and internal consistency only. It sets source verification to false and must not claim factual verification.

2.3.3. Analysis criteria

The structured review considers the following domains for each single-best-answer item:

- Content/key consistency and multiple-correct-answer risk.
- Focused lead-in, cover-the-options test, ambiguity, negative wording and window dressing.
- Distractor plausibility, homogeneity, mutual exclusivity and grammatical/length/logical cues.
- Use of all/none-of-the-above, clinical-vignette realism and safety.
- Learning-outcome and intended cognitive alignment.
- Bias, accessibility, terminology, units and sufficiency of images or chemical structures.
- Duplicate or answer-leaking items and platform-export readiness.

Not psychometric validation: Without examinee-response data, the application does not estimate item difficulty, discrimination, distractor functioning or reliability.

2.3.4. Recommendation decisions

For every finding, faculty must record one of three decisions before the item can be approved:

- **Accept** - adopt the recommendation or agree that the issue requires correction.
- **Reject** - retain the faculty version and document the expert judgment represented by the final item.
- **Addressed manually** - revise the editable final item directly rather than copying the AI proposal.

Apply full proposed version copies the AI-suggested stem, options, key and explanation into the editable final item. The copied content remains unreviewed until faculty reassessment is complete.

2.4. Oversight, Inclusion and Exporting

2.4.1. Inclusion and readiness

An item may be excluded from the final bank. Included items must be reviewed; all analysis recommendations must have decisions; generation-mode evidence must be present or a documented override supplied; and blocking issues must be resolved or explicitly adjudicated.

2.4.2. Available downloads

Output	Contents	Important use note
Faculty Master DOCX	Questions, options, keys, explanations, evidence, review decisions and oversight record.	Full faculty-controlled archive.
Printable Report / PDF	Executive summary, item analysis, evidence, decisions and oversight details.	Opens a print window; choose Save as PDF in the browser.
Student Question Bank DOCX	Questions and options only.	No keys or explanations.
ExamSoft RTF	Numbered questions with the keyed option marked by an asterisk.	Text only; compatible with the supplied ExamSoft template convention.
Moodle Aiken TXT	UTF-8 questions with A., B., C. options and an ANSWER: marker.	Text only; direct Aiken import into Moodle.
ExamSoft Media DOCX	Question-bank version that retains associated figures or chemical structures.	Use when text-only RTF cannot preserve required media.
Moodle Media XML	Moodle multichoice XML with embedded base64 image files.	Use for image-dependent items.
Project Backup JSON	Settings, items, decisions, histories, media and source/question manifests.	Never contains the Gemini API key.

2.4.3. Media-dependent questions

Aiken and text-style RTF cannot carry embedded figures or chemical structures. If included items depend on media, the app blocks those text-only exports unless the user chooses to exclude media-dependent items. Use ExamSoft Media DOCX or Moodle Media XML when the media is required for answering.

2.4.4. Project backup and restoration

- Save a project backup before closing the browser or starting another project.
- The backup retains item versions, decisions, included/excluded status, review state, media and configuration.
- The backup retains source and question file manifests—not the original source bytes. Re-upload the original documents before re-running AI.
- When a saved oversight hash does not match restored item content, the app automatically clears consent.

3. Technical Documentation

3.1. Architecture

MCQ Doctor 5.0.1 is a client-side single-page application delivered as one self-contained HTML file. It requires no application backend, database, build step or runtime content-delivery network. AI requests are sent directly from the user's browser to Google's Gemini API using the user-supplied key.

3.1.1. Application data flow

1. The browser validates the API key and discovers available generateContent-capable Gemini models.
2. Files are read in browser memory and converted to text, inline document parts or multimodal media as appropriate.
3. Generation prompts enforce the exclusive-source contract; analysis prompts separate item-writing review from empirical psychometrics.
4. Gemini responses are received as streamed, schema-constrained JSON and normalized into editable item objects.
5. Faculty edits, decisions, review states and oversight are maintained in browser memory and optional project backups.
6. Exports are generated locally using embedded document/ZIP libraries and browser download APIs.

3.2. Technology stack

Layer	Implementation
Interface	Semantic HTML5, responsive CSS and vanilla JavaScript.
AI transport	Google Gemini REST API: model discovery plus streamGenerateContent using Server-Sent Events.
Structured output	application/json response MIME type with JSON Schema constraints.
Document processing	Embedded JSZip for DOCX/PPTX package reading; DOMParser for XML/HTML; custom RTF and Aiken/ExamSoft parsing.
Document export	Embedded docx JavaScript library for DOCX; local RTF, Aiken and Moodle XML generators; browser print for PDF.
Security primitives	Web Crypto SHA-256, sessionStorage, File/Blob and object-URL browser APIs.
Persistence	No server-side database. Optional user-downloaded .mcqdoctor.json backup.

3.3. File-processing behavior

- PDF and raster images are transmitted as inline multimodal parts.
- DOCX and PPTX are opened as ZIP packages; visible text and supported PNG/JPEG/GIF media are extracted locally.
- RTF control words are converted to text and supported embedded PNG/JPEG pictures are retained when detectable.
- JSON, Aiken and ExamSoft-style content use local deterministic parsers before AI extraction is considered.

3.4. Gemini Model Configuration and Reliability

The application discovers the models available to the user's key and selects the highest-priority compatible free-tier model rather than assuming that every account exposes the same model list.

Role	Priority
Primary quality model	gemini-3.7-flash, then gemini-3.6-flash, gemini-3.5-flash and gemini-2.5-flash when available.
Extraction / high-throughput model	gemini-3.5-flash-lite, then gemini-3.1-flash-lite, followed by compatible Flash models.
Operational fallback	If the primary request times out, is overloaded or returns a retryable incompatibility, the app can continue with an available compatible fallback model.

3.4.1. Version 5.0.1 response handling

- Questions are processed in batches of three.
- Gemini 3-series requests use low thinking effort for reduced latency; Flash-Lite uses minimal thinking effort.
- Responses use streamGenerateContent so the progress interface shows elapsed time and incoming-response activity.
- Each model attempt has a 150-second response timeout instead of waiting indefinitely.
- Retryable failures trigger compatible-model fallback, and the displayed model updates when fallback is adopted.
- If all compatible attempts fail, the exact error persists on the run screen so it can be diagnosed and retried.
- Deprecated sampling parameters are not sent to Gemini 3.7 Flash.

3.5. Security and privacy considerations

- BYOK exposure: A browser-based BYOK application necessarily sends the key from the browser to Google. Users should revoke any exposed key and avoid shared computers.
- No app backend: The application itself does not transmit the key or documents to an Acabuild server, because no application server is present.
- Provider processing: Uploaded content is transmitted to Google Gemini for the requested operation. Google account tier and provider data-use terms apply.
- Browser memory: Project data remains in the current browser context unless the user downloads a project backup.
- Consent integrity: The final oversight hash binds approval to the included item content and selected recommendation decisions.

Institutional deployment: Organizations should complete their own privacy, information-governance, examination-security and acceptable-use review before allowing confidential assessment material to be processed through personal free-tier accounts.

3.6. Methodology and authorship

Concept, domain logic and user-experience design: Prof. Muhammad Al-Shorbagy, Dean, College of Pharmacy, Gulf Medical University. Technical implementation: AI-assisted development through iterative specification, coding, testing and expert review.

The application demonstrates an academic creator / vibe-coding approach: the subject-matter expert defines the assessment logic, safeguards and workflow, while large language models assist with code generation and refinement. Professional accountability remains with the human designer, deployer and reviewer.

3.7. Deployment and Browser Compatibility

3.7.1. Standalone use

- Download the HTML file and open it in a current desktop browser.
- Internet access is required only for Gemini API operations; file preparation and exports occur locally.
- If local file security restrictions interfere with API calls or downloads, deploy the file on an HTTPS static host.

3.7.2. Cloudflare Pages

1. Create a static Pages project and upload the application as index.html at the site root.
2. No framework preset, build command, server function or environment variable is required for the client-side BYOK design.
3. Serve the file over HTTPS with a text/html content type and verify that the Google API domain is not blocked by organizational filtering.
4. Test API validation, a small AI run, DOCX downloads, text exports and the browser print/PDF workflow after deployment.

3.7.3. Embedding in Wix

The most reliable approach is to host MCQ Doctor on Cloudflare Pages or another HTTPS static host, then embed that URL in Wix using Embed a Site / iframe.

- Allow scripts, same-origin access to the hosted application, downloads and pop-up windows where the Wix embed configuration exposes these permissions.
- Give the iframe adequate height and width; the interface is responsive for tablets and mobile devices.
- When the app detects that it is inside an iframe, Open full screen is displayed. Use it if the browser blocks downloads or the print/PDF window in the embedded view.

3.7.4. Supported browsers

Use a current version of Google Chrome, Microsoft Edge, Mozilla Firefox or Safari. Chrome or Edge on desktop is recommended for large files, DOCX generation and platform exports. Browser extensions, corporate filtering, VPNs and strict tracking protection can affect Google API requests or download behavior.

Deployment acceptance test: Validate a key, generate one item from a small source, analyze one sample question, complete oversight and download each required institutional format before publishing the page to users.

4. Troubleshooting & FAQ

Q1. Progress remains on the first generation or analysis batch.

Version 5.0.1 shows elapsed time and streamed-response activity. It waits up to 150 seconds for a model attempt, then tries a compatible fallback when the error is retryable. Keep the tab open. If the operation ultimately fails, copy the persistent error shown on the run screen.

- Confirm that the browser or institutional network permits requests to generativelanguage.googleapis.com.
- Try a smaller source file or fewer questions to distinguish source-size latency from an account/quota problem.
- Use Change key and validate a newly created authorization key from a personal Gmail account.

Q2. I receive an API-key or authorization error.

- Create a new authorization key in Google AI Studio and paste it without leading or trailing spaces.
- Confirm that the key's project permits Gemini / Generative Language API access and that account quota is available.
- Avoid institutional Google accounts if AI Studio or free-tier access is restricted.
- Check VPN, firewall, proxy, browser privacy extension and content-security-policy restrictions.

Q3. The app reports an overload, quota or timeout.

Wait briefly and retry. The free tier can experience capacity and rate limits. Version 5.0.1 automatically tries an available compatible fallback model for retryable failures, but it cannot bypass an exhausted project-level quota or a blocked network.

Q4. The generated item lacks defensible source support.

Do not approve it. Check that the uploaded source actually contains the required fact, refine the learning outcome or constraints and regenerate. Alternatively, exclude the item. An expert override should be used only when the reviewer can independently justify and document the final content.

Q5. The uploaded bank did not preserve the correct answer.

Ensure the source explicitly marks the key. For Aiken, use ANSWER: followed by the option letter. For ExamSoft-style RTF, prefix the correct option with an asterisk. For other documents, visibly identify the key; otherwise the extractor should leave it blank rather than infer it.

Q6. An image or chemical structure is missing.

- Use PNG or JPEG when possible; ensure the image is embedded rather than externally linked.
- Verify the media association in the editable item before review approval.
- Use the media-capable ExamSoft DOCX or Moodle XML export rather than text-only RTF or Aiken.

Q7. The report or download does not open in Wix.

Select Open full screen, allow pop-ups and downloads for the hosting domain, then retry. The printable report uses a new browser window so the browser can provide Print / Save as PDF.

Q8. My .doc file is rejected.

The legacy binary .doc format is intentionally unsupported. Save or convert the document to DOCX or PDF and upload the converted file.

Q9. A restored project cannot run AI again.

Project backups contain source manifests but not the original uploaded source files. Re-upload the original sources or question files before running generation, extraction or analysis again.

5. Faculty Final-Review Checklist

Before confirming oversight, the responsible faculty reviewer should be able to answer Yes to every applicable statement:

- The stem is clear, focused and contains only information needed to answer the question.
- The lead-in can be answered without viewing the options and is appropriate for the stated learner level.
- Exactly one option is defensibly correct; the key matches the final wording.
- Distractors are plausible, homogeneous, mutually exclusive and free of avoidable cues.
- Clinical details, terminology, units and safety implications are accurate.
- The explanation correctly justifies the key and does not introduce unsupported claims.
- Generation-mode evidence is present, locatable and genuinely supports the correct answer.
- Required figures or chemical structures are legible, correctly associated and included in the selected export format.
- Every AI recommendation has been accepted, rejected or addressed manually with appropriate expert judgment.
- Blocking issues are resolved or a defensible expert override has been documented.
- No identifiable patient/student data or unauthorized confidential material is present.
- The final export has been opened and spot-checked in the destination platform before operational use.

6. Version 5.0.1 Release Summary

- Added source-exclusive MCQ generation with evidence citations and an independent verification pass.
- Added two-mode workflow: source-grounded generation and analysis/improvement of existing banks.
- Added editable recommendation decisions, item-version restoration and content-bound human oversight consent.
- Added faculty/student DOCX, printable report, ExamSoft RTF/DOCX, Moodle Aiken/XML and project-backup exports.
- Added image and chemical-structure handling with safeguards for text-only exports.
- Added responsive Wix/iframe support and an Open full screen recovery path for restricted downloads.
- Version 5.0.1 specifically replaced fixed first-batch waits with streamed progress, low-thinking Gemini configuration, smaller batches, timeouts, compatible-model fallback and persistent diagnostic errors.

Professional-use statement: MCQ Doctor supports assessment development and quality assurance. It does not certify compliance, replace content experts, or constitute empirical psychometric validation.

End of Documentation