



TAQYEEM STEAM — WORKED EXAMPLE

“Why does our neighbourhood flood, and what would fix it?”

Domain: Engineering + environmental science + social science — a cross-domain STEAM project tied to Vision 2030 sustainability and SDG Goals. **Level:** Grades 12 – 14.



How a conventional class would do this (the thing we replace)

The teacher lectures on the water cycle and drainage, gives a worksheet, students memorise the terms, and a test asks them to define “runoff” and “permeability.” Nobody builds anything. Nobody investigates their own street. The exam measures recall.

How Taqyeem STEAM does it — stage by stage

Stage 1 — Socratic launch (*inquiry, not lecture*)

The mentor doesn’t explain flooding. They ask: “Your area floods after heavy rain. Why? What if it were the road surface? What if it were where the water has to go? How could you find out which it is?”

The student has to form a hypothesis (“I think it’s because the new concrete lots can’t absorb water”) rather than receive an answer. This is the “think like a scientist” step — hypothesise before you investigate.

Stage 2 — Investigation and building (*project work*)

The student:

- Measures how fast water drains on different surfaces near their home (sand vs concrete vs tiled)

- Builds a small physical model or simple simulation showing water flow
- Collects local data — rainfall figures, photos of flooding, and interviews with neighbours about when it started getting worse

That last part — talking to the community, using local knowledge — is where the social-science strand enters naturally, and where the culturally responsive angle has real substance: the student's communal knowledge (elders remembering how the area drained before it was developed) is treated as legitimate evidence, not dismissed as "anecdote."

Stage 3 — Iteration *(where real scientific thinking is built)*

Their first model fails — water pools where it shouldn't. The mentor asks why, the student adjusts (changes the slope, adds a permeable layer), and tests again. This failure-and-retry loop is logged.

The iteration log is the single most compelling thing for a university admissions reader — it shows resilience and genuine problem-solving, not a polished first attempt.

Stage 4 — Assessment at the Service of Learning *(the differentiator)*

The student writes up the project. In their natural style, they open with community context — "for generations this area drained into the wadi, until recent construction" — before stating their finding.

A standard rubric marks this down: "thesis buried, state your conclusion first."

Taqyeem STEAM's assessment separates the two: the engineering reasoning is scored on its merits (strong), and the rhetorical structure is named as a valid choice, not a flaw.

The student keeps their own voice for their portfolio, and is also coached to produce a thesis-first version for a foreign university application — so they have both, and understand when to use each.

The project runs through five lenses, not one teacher's opinion:

- Self-assessment — the student rates their own work first
- Peer review — another student critiques using the same rubric
- Teacher assessment
- Mentor assessment — applying the culturally responsive standard formally
- AI check — for documentation completeness

Stage 5 — Competition and ePortfolio *(external validation)*

The finished project — model, data, write-up, iteration log — is entered into a Taqyeem STEAM online competition. Whether it places or not, it's now an externally validated, documented artifact.

Stage 6 — University application payoff *(the outcome)*

When this student applies abroad, they don't write a vague "I'm interested in engineering." They attach a documented project: a real problem in their own community, a tested solution, evidence of iteration, and a reflection on what they learned. That's exactly what selective engineering

programmes and scholarships are looking for — and the student built genuine scientific reasoning along the way, not just a line on a CV.

One project, four problems solved: Socratic inquiry instead of memorising; real documented work instead of nothing to show; culturally responsive assessment instead of penalised reasoning; and a competition-validated, university-ready portfolio.