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Exploring Lecturers' Perceptions and Practices of Information and Communication Technology Integration in Teaching at the Higher Institute of Water Affairs, Ajilat, Libya: A Critical Secondary-Empirical Analysis

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Abstract
Teaching with information and communication technology (ICT) is not equivalent to integrating it pedagogically. This critical secondary-empirical article examines how published Libyan lecturer research and recent UK staff surveys illuminate the relationship between positive attitudes, enacted teaching practices and institutional constraints in the context of the Higher Institute of Water Affairs, Ajilat. A transparent purposive synthesis differentiates interview/observation evidence, questionnaire results and sector benchmarks. Salem's (2019) Libyan university case study involved 12 lecturer interviews and classroom observations; a 2023 Libyan survey of 100 lecturers reported a mean of 3.54 on its technology-use measure; and a 2026 qualitative study documented tensions around time, disruptions and digital confidence among ten teachers. The UK Jisc 2024/25 higher-education teaching-staff survey (n = 1,765) reported that 64% rated their digital teaching environment positively, while 53% rated technology support above average and 23% reported AI-training provision. A further-education survey (n = 763) found 65% reporting wifi problems and 41% device difficulties. Cross-study synthesis suggests a recurrent attitude–practice–conditions gap, but does not establish its prevalence in Ajilat or the causal effects of particular technologies. The paper advances an observable, domain-specific ICT-pedagogy framework, includes source-labelled figures and develops an ethically feasible mixed-methods field protocol that measures actual practice alongside lecturer perceptions.
Keywords: ICT integration; technical pedagogy; lecturers' perceptions; TPACK; teaching observations; digital inequality; Libya

1. Introduction and problematisation
A lecturer who projects slides is using ICT, but an instructor who asks students to manipulate a pump curve, interpret a borehole log and justify a pumping recommendation is integrating technology into a disciplinary task. Both situations may look identical in an institutional inventory of "digitally equipped classrooms", even though their educational contributions differ. This distinction matters at technical institutes because professional competence is evidenced by analysis, measurement, applied judgement and safe procedures, not merely attendance or material distribution.

The Higher Institute of Water Affairs, Ajilat, provides a useful institutional focus for a future case study of lecturers' perspectives and everyday teaching practices. However, publicly reported studies from other Libyan institutions cannot be treated as direct evidence of its lecturers. This article uses those studies to challenge three common assumptions: that a favourable attitude reliably predicts classroom enactment, that equipment automatically changes pedagogy, and that technology-intensive UK practices can be transferred unchanged to Libya.

In conceptual terms, "perceptions" concern beliefs about value, effort and risk; "practice" requires documentation of actual choices, lesson sequences and student participation; and "integration quality" concerns the relation between a digital resource, subject content, learner activity and assessment. Stronger scholarship must measure these constructs separately.

2. Theory and questions

The Technology Acceptance Model distinguishes perceived usefulness and ease of use (Davis, 1989), while UTAUT introduces social influence and facilitating conditions (Venkatesh et al., 2003). Both explain adoption-related intention, but neither in itself establishes pedagogy quality or demonstrable student learning. Technological Pedagogical Content Knowledge (TPACK; Mishra & Koehler, 2006) provides a disciplinary corrective by asking whether technology is combined meaningfully with subject content and teaching method. A technical education extension should add explicit attention to the reliability of representations, such as whether visualisations preserve correct units and engineering assumptions.

Salem's (2019) Libyan doctoral study is analytically important because its 12 lecturer interviews and classroom observations foregrounded cultural and sociopolitical conditions rather than treating western technology standards as neutral. Its exclusion of female lecturers also exposes a boundary of the evidence: what appears as a general account of Libyan lecturer experience may omit gendered constraints and perspectives. The present synthesis therefore treats context not as background "noise" but as an explanatory dimension.

The questions are: (1) What evidence separates Libyan lecturers' stated enthusiasm from documented technology use? (2) Which infrastructural and organisational factors repeatedly appear alongside adoption? (3) What do UK higher and further education survey results reveal about the distinction between digital environment ratings and effective capacity? (4) Which observable indicators would support a defensible Ajilat-specific case study?

3. Materials, selection and analytic method

A targeted set of publisher-hosted journal abstracts, university repository summaries and UK sector-survey results was reviewed on 24 October 2026. The paper is a structured critical secondary analysis, not an exhaustive systematic review. Studies were purposefully retained where they reported lecturer teaching-technology practice, attitudes or constraints, identifiable methods and relevant educational populations. Libyan higher education sources were prioritised; a secondary-school qualitative study was included only for a sharply qualified comparison of teacher confidence and implementation time. UK Jisc HE and FE datasets were analysed as external comparator contexts and not merged.

The extraction framework classified empirical claims under reported use, observed enactment, perceived value, facilitating conditions, or student-learning evidence. We recorded sample sizes and statistics only where provided by their public sources. For example, a mean of 3.54 in one instrument is not comparable to 64% of staff rating their environment favourably in a different survey; converting the former into a percentage or creating an aggregate from the two would be

invalid. The qualitative synthesis used theoretically informed coding around capability, infrastructure, pedagogical transformation, student agency and situational constraint. It did not invent participant quotes or claim line-by-line access to unreviewed transcripts.
Critical appraisal addressed respondent selection, single-site dependence, recall and self-report, missing observation data, broadness of ICT definitions, uncertainty about response scales, and external validity. The resulting evidence matrix supports analytical claims about recurrent relationships but not prevalence or causal parameter estimation at the Ajilat institute.

Table 1. Comparative design and inference strengths in selected ICT studies

Source / context	Original method and sample	Reported observation	Interpretation and limitation
Salem (2019), Libyan university	12 interviews + classroom observations	Culture, sociopolitical context and practitioner conditions matter	Rich enacted practice; excludes female lecturers and single institution
Alamaria (2023), Libyan universities	Questionnaire; 100 EFL lecturers	Technology-use mean 3.54; favourable online-teaching perceptions	Self-report in pandemic setting; specific scale anchor not reconstructed
Alasmarya study (2023), Zliten	Survey; 26 EFL lecturers	Positive perceptions co-occurred with connectivity, computer and support problems	Local thesis/repository evidence; not observation
Elmadwi & Ahmad (2026), Al-Jumail	Ten semi-structured teacher interviews	Motivation benefits vs time, disruption and literacy barriers	Secondary-school setting, not technical higher education
Jisc (2025b), UK higher education	1,765 teaching staff from 22 organisations	64% positive environment; 53% above-average support	Sector-level self-report, self-selecting providers
Jisc (2025a), UK further education	763 teaching staff from 18 organisations	65% wifi issues; 41% unsuitable devices	Useful technical-sector analogy, not Libyan base rates

4. Results: recurring empirical patterns

4.1 Positive disposition coexists with incomplete enactment evidence. Alamaria (2023) surveyed 100 Libyan university EFL lecturers and reported a technology-use mean of 3.54, alongside favourable views of online teaching during the COVID-19 period. The result is consistent with perceived acceptance but does not tell us how many lessons involved student-led use, how accurate the instructional content was, or what students learnt. A separate Alasmarya survey of 26 lecturers (Idriyush et al., 2023) similarly reported favourable views while identifying connectivity, hardware, technical assistance and competence gaps. These are compatible findings, but their questionnaires are not interchangeable measures of a single latent variable.
Salem (2019) offers an important counterbalance by combining perceptions and lesson observation. Its interpretation of professional learning within Libyan sociocultural and political contexts challenges the notion that low use is simply a lecturer motivation problem. Elmadwi and Ahmad (2026) reported from ten interviews in Al-Jumail that technology could support engagement and individualisation but could also consume preparation time, disrupt lessons and expose low digital confidence. The evidence is qualitatively consistent across contexts, but a secondary-school observation cannot be treated as an estimate of tertiary technical behaviour.
4.2 Sector satisfaction masks capability gaps. The 2024/25 UK HE teaching-staff survey recorded positive digital-environment ratings from 64% and above-average organisational support from 53% of 1,765 respondents. Yet only 23% reported provision of AI training and 11% data-analysis training (Jisc, 2025b). These indicators represent distinct survey items; their disparity is a

descriptive juxtaposition, not a paired estimate of unmet needs. In the UK FE survey (n = 763), 70% reported producing/uploading online content or using interactive apps, while 65% reported wifi trouble, 48% system-access difficulty and 41% unsuitable devices at some point (Jisc, 2025c). This demonstrates that digital activity and technical problems can coexist in established educational systems.

4.3 Practice remains undermeasured relative to perceptions. Within this purposive set, surveys supply more directly extractable adoption frequencies than robust classroom outcome observations. Student learning, technical reasoning and domain error rates are rarely linked to specific ICT teaching episodes in public summaries. This imbalance helps explain why "technology improves learning" may be inferred from staff agreement without a measured performance difference. For the Ajilat institute, it is not enough to estimate software use; direct lesson observation and student-task evidence will be essential.

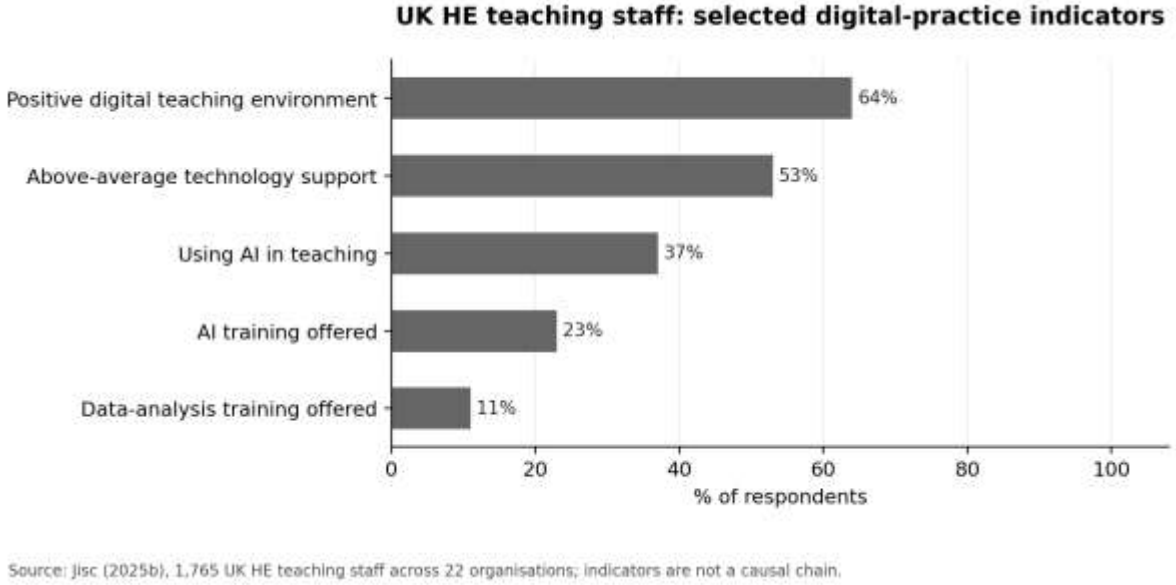


Figure 1. Distinct survey-item percentages reported by UK higher-education teaching staff, Jisc (2025b).

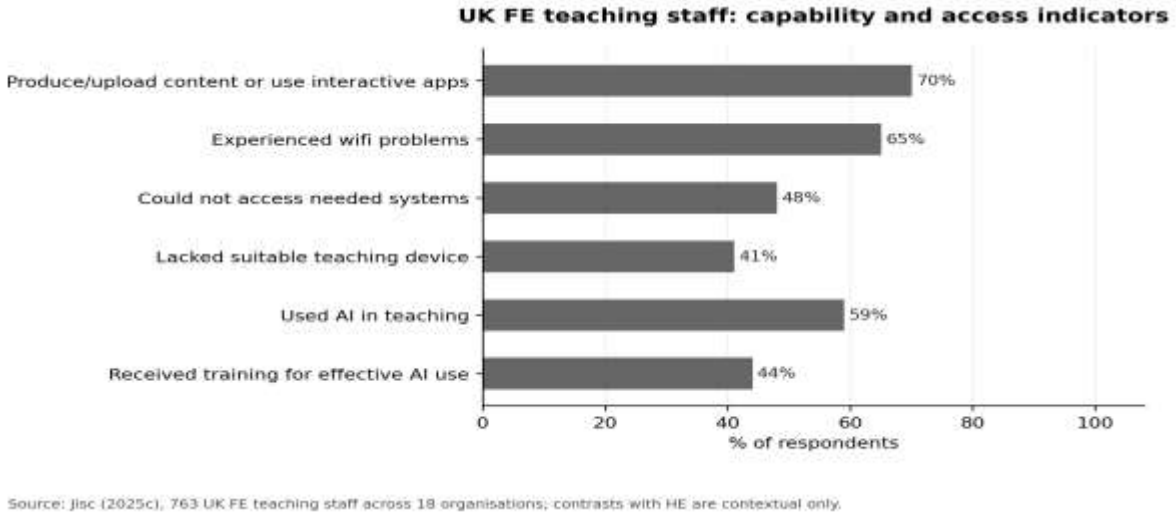


Figure 2. UK further-education teaching staff indicators, Jisc (2025a); separate population from Figure 1.

5. Critical explanation of the attitude–practice–conditions gap

A surface-level interpretation would call for additional computers and workshops. A more critical interpretation separates necessary enabling conditions from sufficient pedagogical conditions. Connection, equipment and institutional support can permit a digital activity, but neither guarantees a useful learning task nor enables technical reasoning. A projected hydrological chart may simply replace a blackboard sketch; by contrast, student-controlled spreadsheet modelling might permit sensitivity analysis and evidence-based discussion even on an offline machine. Accordingly, counts of digital devices should not be used as a proxy for quality of integration.

The traditional adoption literature is also exposed to reverse causality and common-method bias: lecturers who already use tools may subsequently rate them useful, and asking the same respondent about their enthusiasm and practice tends to inflate correlations. TPACK is valuable because it requires an explicit match among technological affordances, instructional design and content demands, but even a self-reported TPACK inventory may overstate competence. Observation therefore needs behaviourally anchored categories, not global observer impressions.

The UK evidence is particularly useful as a caution against deficit narratives about Libya. Material constraints are documented among well-funded UK providers; it would be inappropriate to explain Libyan non-use exclusively through individual professional resistance. At the same time, institutional practices cannot be imported without adaptation: bandwidth, timetabling, maintenance, procurement, linguistic resources and emergency resilience shape whether a lesson plan is realistic. Salem's (2019) sociopolitical emphasis makes this a substantive theoretical matter rather than a footnote.

The most consequential equity question concerns access to meaningful participation. If an instructor demonstrates a simulation while students only watch, technology may concentrate control. If small groups can enter data, predict an outcome, test assumptions and explain discrepancies, it may distribute epistemic agency. The proposed evaluation must therefore count substantive student actions and feedback opportunities rather than screen time.

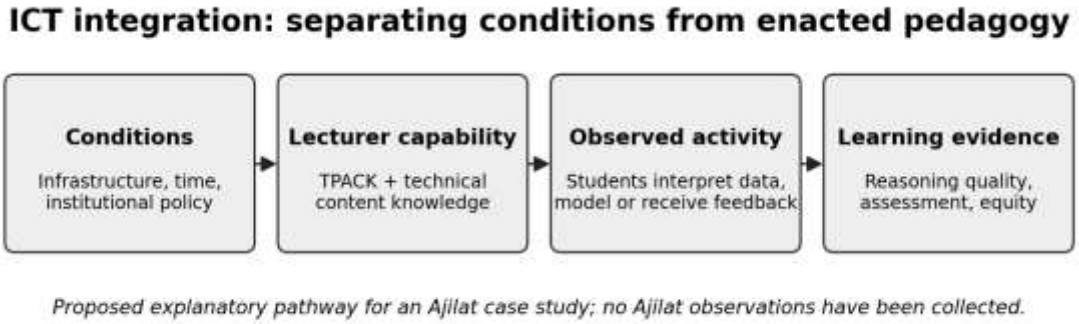


Figure 3. Author-developed analytic model for evaluating enacted ICT pedagogy; hypothetical, not an observed Ajilat pathway.

6. Protocol for a rigorous Ajilat lecturer case study

Following ethical and institutional approval, a bounded mixed-methods case study should first enumerate eligible lecturers across technical programmes, rather than recruiting only digitally enthusiastic volunteers. A confidential questionnaire would measure perceived usefulness and ease, digital confidence, facilitating conditions, professional-learning access and actual frequency of pedagogical practices, anchored to a defined recent teaching period. It should be piloted for intelligibility and content validity. Scale reliability can be estimated only after data are collected,

using an appropriate statistic such as omega with confidence intervals; unsupported claims of "validated instruments" must be avoided.

A stratified purposive interview sample should capture discipline, seniority, gender where ethically appropriate, experience and high/low technology use. Observation of consenting lecturers' teaching should employ an explicit coding schedule: intended learning outcome; domain content; digital resource; learner action; diagnostic questioning; feedback; time lost to disruption; access accommodations; and demonstrated reasoning. Two trained observers should code a subset independently and report agreement before resolving discrepancies. Student work samples, with consent and de-identification, provide a useful form of triangulation.

Survey findings can be analysed descriptively, with explicitly pre-specified associations between facilitating conditions and observed practice. If sample sizes are small, prioritise estimates and qualitative explanation over underpowered regression models. Integrated joint displays should place a lecturer's stated belief alongside observed activity and the availability of relevant equipment, while protecting identity. Negative cases—high confidence but weak interaction, or sophisticated pedagogy with minimal infrastructure—are analytically central. Researcher positionality, consent, confidentiality and administrative independence must be documented.

7. Analytical triangulation and threats to interpretation

The methodological contribution of a site-based study lies in its potential to challenge survey findings with observations. For example, suppose a lecturer rates ICT as highly useful but uses a projector only to display static notes; that is not necessarily hypocrisy or failure. It may reflect equipment constraints, class size, a requirement to cover a syllabus or the appropriateness of direct demonstration for a particular outcome. Conversely, a lecturer with low general technology confidence may use a simple offline spreadsheet to support collaborative data interpretation. Treating either lecturer as "high" or "low" on an unqualified integration index would discard the most explanatory evidence.

A planned joint display should retain respondent anonymity while linking several kinds of evidence at the case level: reported use, independently coded teaching episodes, contextual interview explanation, and anonymised student-task outputs. Contradictions between those streams deserve focused analysis. Within-case explanations should be constructed before an across-case thematic comparison, and the analytic memo should separate what was witnessed from what was interpreted. A second coder can independently label a subset of episodes, with adjudication criteria recorded rather than assuming that coding agreement is self-evident.

Several plausible rival causes of observed student differences must be considered: specialist topic difficulty, baseline learner knowledge, class size, lecturer experience, timetable disruptions, external software support, and differences in assessment standards. Without appropriate comparison teaching episodes and pre-intervention information, observing engaged students after an interactive digital lesson does not show that ICT caused the engagement or any gain in technical reasoning. Statistical claims should remain modest if the lecturer population is small, and the number of observed lessons, not merely the number of teachers, must be disclosed when describing practice patterns.

Equity testing should be integrated into the design. If an assignment requires internet access outside scheduled hours, the study should ask whether some learners can only use shared devices, whether files work offline, and whether accommodations exist. An observed rise in digital activity could otherwise accompany poorer participation among students with limited access. This shifts evaluation from individual lecturer enthusiasm to the distribution of meaningful learning opportunities.

Table 2. Example joint display structure for future fieldwork (all entries are hypothetical categories)

Evidence stream	What must be recorded	What it can establish
Questionnaire	Anchored use frequency and conditions by teaching period	Reported perceptions and practices
Lesson observation	Time-coded student actions, feedback, technical precision	Enacted practices in sampled lessons
Interview	Specific decisions and constraints linked to observations	Participants' own explanations
Student tasks	De-identified work scored against subject rubric	Evidence of performance, not causality on its own
Infrastructure audit	Offline alternatives, reliability and device availability	Contextual feasibility and equity

8. Implications, limitations and conclusion

The immediate policy implication is a tiered professional-development approach. First establish stable access, basic assistive and offline facilities, and responsive technical support. Next focus workshops on discipline-specific pedagogical challenges: interpreting graphs, using short simulations, facilitating peer explanations, and giving formative feedback. Finally, evaluate improvement with observed student activity and authentic task performance, rather than counting training attendance or procurement milestones. A low-resource offline demonstration can be pedagogically stronger than an online activity that excludes some students.

Limitations include purposive source selection, conceptual heterogeneity, limited published observation detail, incomplete subgroup data, and UK–Libya non-equivalence. None of the numerical results describe lecturers at the Higher Institute of Water Affairs. The paper's defensible conclusion is that successful ICT integration is best understood as a context-dependent alignment of enabling conditions, professional judgement, disciplinary knowledge and observable student engagement. Direct fieldwork at Ajilat is necessary before reporting institutional estimates, explanatory models or student outcomes.

Author declarations for completion before journal submission

Ethics: This document reports analysis of already published, publicly accessible studies and introduces no new human-participant data. Funding, competing interests, correspondence details, author contributions, affiliation approval and final manuscript approval must be completed and verified by the named authors before submission. Data availability: Numerical values used in the figures are transcribed from the cited public reports; no original institutional participant-level dataset exists for this article.

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