

DELTA UNIVERSITY

FACULTY OF POSTGRADUATE STUDIES

The DELTA-IMPACT 1.0 Framework

Methodological Guide

Delta University for Science and Technology

Strategic Blueprint for Measuring Interdisciplinary Research Success at Delta University

Introduction

The DELTA-IMPACT 1.0 Framework is Delta University's proprietary, data-driven evaluation matrix designed to rigorously measure, guide, and enhance the success of interdisciplinary research. Moving beyond traditional publication counts, this comprehensive system evaluates academic efforts across five key pillars: pre-execution synergy, educational integration, global bibliometric foresight, societal and economic translation, and institutional commitment. By algorithmically mapping research outputs to the UN Sustainable Development Goals (SDGs), tracking citation impact, and measuring translation into industrial partnerships, patents, and strategic visibility, DELTA-IMPACT ensures that the university's cross-faculty endeavors deliver measurable societal value and global impact. The present enhanced version preserves the original framework and incorporates a supplementary layer of publication-level bibliometric indicators to strengthen the direct measurement of interdisciplinary science and research performance.

Methodology

Pillar 1: Pre-Execution Quality Control & Strategic Alignment

Objective: To mathematically ensure that research proposals are genuinely interdisciplinary and aligned with shared infrastructure before they are executed or funded.

- **1.1 The Interdisciplinary Integration Score (IIS)**
    - **Methodology:** A rubric-based evaluation conducted by the FGSAIS Graduate Studies Committee during the research protocol approval phase.
    - **Calculation Formula:** Scored on a scale of 1 to 5 based on two weighted variables:
        1. ***Disciplinary Distance:*** Measured by the gap between the ASJC (All Science Journal Classification) codes of the merging fields (e.g., merging AI with Clinical Medicine yields a higher distance score than merging two sub-fields of Mechanical Engineering).
        2. ***Methodological Blending:*** Evaluates whether the proposal creates a novel mixed methodology (high score) or simply borrows a standard analytical tool from another field (low score).
    - **Purpose:** To ensure that only genuinely interdisciplinary protocols are formally recognized and advanced within the university system.
    - **Target KPI:** ≥ 50% of approved protocols should score ≥ 3.5.
    - **Data Source:** FGSAIS Graduate Studies Committee for Research
- **1.2 Central Unit Alignment Score**
    - **Methodology:** A logistical audit metric evaluated during the grant application phase to ensure optimal use of Delta University's shared physical facilities.

- **Calculation Formula:** (Number of research projects of practical execution hours inside Central Research Units (e.g., Nanomedicine Unit, Center of Urban Excellence, etc.) / Total number of projects in isolated departmental labs) × 100
- **Purpose:** To maximize use of shared high-value infrastructure and discourage fragmented execution in isolated departmental labs.
- **Target:** ≥ 70%
- **Data Source:** Central Labs Administration / Grant Office.

Pillar 2: Institutional Synergy & Capacity Building

Objective: To measure the success of breaking down internal academic silos and tracking the physical and educational capacity building of staff and students.

- **2.1 The Joint Supervision Index**
  - **Methodology:** A quantitative HR and academic affairs metric tracking cross-faculty integration.
  - **Calculation Formula:** (Number of active postgraduate theses officially co-supervised by faculty members from ≥ 2 distinct university faculties / Total number of active postgraduate theses at the university) X 100.
  - **Purpose:** To measure institutional collaboration in postgraduate supervision and reduce disciplinary isolation at thesis level.
  - **Target KPI:** ≥ 15%
  - **Data Source:** University Postgraduate Affairs Database.

- **2.2 Capacity Building & Global Upskilling Rate**
    - **Methodology:** Tracks the translation of administrative training into actionable scientific output.
    - **Calculation Formula:** (Number of trained staff who subsequently publish a Q1 cross-faculty paper as first author / Total number of staff who completed internal or EKB interdisciplinary training) × 100.
    - **Purpose:** To evaluate whether capacity-building programs are producing measurable high-quality interdisciplinary research outcomes.
    - **Target KPI:** ≥ 40%
    - **Data Source:** EKB Training Coordinators/ Research Office
- **2.3 Undergraduate Curricular Integration**
    - **Methodology:** Educational analytics measuring the penetration of interdisciplinary systems thinking into foundational undergraduate curricula, especially through the "Engineer's Journey" model.
    - **Calculation Formula:** Net success rate of cohorts using the interdisciplinary curricular model, measured through syllabus audits and cohort performance tracking.
    - **Purpose:** To assess whether interdisciplinary curriculum redesign improves learning outcomes and retention at undergraduate level.
    - **Target KPI:** ≥ 84.5%

- **Data Source:** Vice President of Student Affairs / Quality Assurance Center

- **2.4 Undergraduate Pipeline Transition Rate**
  - **Methodology:** Measures the percentage of students who graduate from interdisciplinary undergraduate programs and transition into targeted postgraduate tracks within a defined period.
  - **Calculation Formula:** (Number of graduates from interdisciplinary BSc programs (e.g., bioinformatics, Mechatronics) enrolling in interdisciplinary postgraduate tracks / Total number of graduates from interdisciplinary BSc programs) × 100
  - **Purpose:** To evaluate the continuity of interdisciplinary talent development from undergraduate education into postgraduate research.
  - **Target KPI:** ≥ 20%
  - **Data Source:** Alumni Office / FGSAIS Admission

Pillar 3: Global Excellence & Strategic Foresight

Objective: To utilize advanced AI-driven bibliometrics to position Delta University at the cutting edge of global, highly-cited scientific discovery.

- **3.1 Interdisciplinarity Index (I-Index) Optimization**
  - **Methodology:** Utilizing Clarivate's Research Horizon Navigator (RHN), the university's average institutional I-Index will be tracked annually.

- **Calculation Formula:** Institutional average Interdisciplinarity Index (I-Index) automatically calculated by RHN based on the diversity and balance of disciplinary categories cited in Delta University papers.
- **Purpose:** To measure the intellectual diversity of the knowledge base underpinning Delta University's research outputs and encourage broader integration of disciplinary perspectives.
- **Target:** ≥ 0.55.
- **Data Source:** Research Office/ Clarivate (RHN)

- **3.2 Horizon "Core Papers" Targeting Rate**
  - **Methodology:** Predictive impact measurement using Clarivate RHN.
  - **Calculation:** (Number of Delta papers classified as "Co-citing Papers" building on emerging Core Papers / full annual Delta publication output in WoS excluding ESCI documents) × 100
  - **Purpose:** To ensure Delta University's interdisciplinary science is positioned within emerging high-growth research fronts.
  - **Target KPI:** ≥ 25%
  - **Data Source:** Research Office / Clarivate RHN.
- **3.3 Interdisciplinary Field-Weighted Citation Impact (FWCI)**
  - **Methodology:** Field-Weighted citation impact measurement using Elsevier's SciVal.

- **Calculation Formula:** Average university FWCI for publications filtered by the "Multidisciplinary" ASJC category.
- **Purpose:** To benchmark the citation performance of Delta University's interdisciplinary outputs against the global average.
- **Target KPI:** ≥ 2.05
- **Data Source:** Elsevier SciVal

- **3.4 THE Cross-Field Publication Rate**
  - **Methodology:** Publication-level bibliometric analysis using Times Higher Education field mapping.
  - **Calculation Formula:** (Number of outputs assigned to **2 or more THE fields** / Total number of outputs) × 100
  - **Purpose:** To measure the share of outputs that cross formal THE disciplinary boundaries and provide a visible institutional indicator of interdisciplinary publication activity.
  - **Target KPI:** ≥ 55%
  - **Data Source:** SciVal/Scopus export with THE field name mapping.
- **3.5 Deep THE Interdisciplinarity Rate**
  - **Methodology:** Advanced classification-depth measurement using THE field mapping.
  - **Calculation Formula:** (Number of outputs assigned to **3 or more THE field names** / Total number of outputs) × 100
  - **Purpose:** To distinguish deeply interdisciplinary outputs from publications showing only limited two-field overlap.
  - **Target KPI:** ≥ 15%

- **Data Source:** SciVal/Scopus export with THE field name mapping.

- **3.6 ASJC Multi-Category Publication Rate**
  - **Methodology:** Scopus subject-classification breadth analysis using ASJC field assignments.
  - **Calculation Formula:** (Number of outputs assigned to **2 or more ASJC fields** / Total number of outputs) × 100
  - **Purpose:** To provide a robust Scopus-based measure of interdisciplinary breadth across indexed subject categories.
  - **Target KPI:** ≥ 75%
  - **Data Source:** Elsevier SciVal / Scopus ASJC field classification.
- **3.7 Deep ASJC Interdisciplinarity Rate**
  - **Methodology:** Advanced ASJC-based depth analysis.
  - **Calculation Formula:** (Number of outputs assigned to **3 or more ASJC fields** / Total number of outputs) × 100
  - **Purpose:** To capture more complex disciplinary integration across multiple indexed subject domains.
  - **Target KPI:** ≥ 58%
  - **Data Source:** Elsevier SciVal / Scopus ASJC field classification.
- **3.8 Interdisciplinary FWCI Premium (THE)**
  - **Methodology:** Comparative citation-performance analysis based on THE field integration.
  - **Calculation Formula:** Mean FWCI of outputs assigned to **2 or more THE fields** / Mean FWCI of outputs assigned to **1 THE field**
  - **Purpose:** To determine whether cross-field outputs achieve a citation advantage over more disciplinary outputs using THE classification.

- **Target KPI:** ≥ 1.15
- **Data Source:** Elsevier SciVal + THE field mapping.

- **3.9 Interdisciplinary FWCI Premium (ASJC)**
  - **Methodology:** Comparative citation-performance analysis based on ASJC integration.
  - **Calculation Formula:** Mean FWCI of outputs assigned to **2 or more ASJC fields** / Mean FWCI of outputs assigned to **1 ASJC field**
  - **Purpose:** To provide a stronger Scopus-grounded benchmark for the citation advantage generated by interdisciplinary work.
  - **Target KPI:** ≥ 1.35
  - **Data Source:** Elsevier SciVal + ASJC field classification.
- **3.10 Top 10% Citation Rate for Cross-Field Outputs**
  - **Methodology:** Excellence-focused bibliometric benchmarking of interdisciplinary outputs.
  - **Calculation Formula:** (Number of cross-field outputs falling within the **top 10 citation percentile** / Total number of cross-field outputs) × 100
  - **Purpose:** To connect interdisciplinarity directly to elite scholarly performance rather than simple output volume.
  - **Target KPI:** ≥ 35%
  - **Data Source:** Elsevier SciVal citation percentile indicators.
- **3.11 High-Prominence Interdisciplinary Topic Rate**
  - **Methodology:** Frontier-positioning analysis using Topic Prominence Percentile.

- **Calculation Formula:** (Number of interdisciplinary outputs with **Topic Prominence Percentile ≥ 90** / Total number of interdisciplinary outputs) × 100
- **Purpose:** To measure whether interdisciplinary outputs are positioned in globally prominent and strategically important research topics.
- **Target KPI:** ≥ 75%
- **Data Source:** Elsevier SciVal Topic Prominence Percentile.

- **3.12 Mean Topic Cluster Prominence of Interdisciplinary Outputs**
  - **Methodology:** Mean topic-cluster visibility analysis
  - **Calculation Formula:** Mean Topic Cluster Prominence Percentile for interdisciplinary outputs
  - **Purpose:** To track the average frontier position of Delta University's interdisciplinary topic clusters.
  - **Target KPI:** ≥ 80
  - **Data Source:** Elsevier SciVal Topic Cluster Prominence Percentile.
- **3.13 Multi-Institution Interdisciplinary Collaboration Rate**
  - **Methodology**: Institutional-network analysis of interdisciplinary publications.
  - **Calculation Formula:** (Number of interdisciplinary outputs involving 2 or more institutions / Total number of interdisciplinary outputs) × 100
  - **Purpose:** To measure the extent to which interdisciplinary outputs are produced through wider institutional research networks.
  - **Target KPI:** ≥ 95%

- **Data Source:** Scopus / SciVal Institution affiliation data.

- **3.14 International Interdisciplinary Collaboration Rate**
  - **Methodology:** Global network analysis of interdisciplinary publications.
  - **Calculation Formula:** (Number of interdisciplinary outputs involving 2 or more countries/regions / Total number of interdisciplinary outputs) × 100
  - **Purpose:** To capture the internationalization of interdisciplinary science and align the framework with global research competitiveness.
  - **Target KPI:** ≥ 75%
  - **Data Source:** Scopus / SciVal country affiliation data.

Pillar 4: Societal Impact & Economic Translation

Objective: To quantitatively measure how interdisciplinary research solves real-world problems and translates into economic value and societal relevance.

- **4.1 SDG Semantic Mapping Score**
  - **Methodology:** AI-assisted semantic analysis mapping research outputs to the UN Sustainable Development Goals using SciVal SDG tagging algorithms**.**
  - **Calculation Formula:** *(Number of research outputs explicitly linked to **2 or more distinct SDGs** / Total number of research outputs) × 100*

- **Purpose:** To measure the extent to which Delta University's research addresses interconnected societal challenges rather than isolated domains.
- **Target KPI:** ≥ 60%
- **Data Source:** Elsevier SciVal / Research Office

- **4.2a IP Generation (Commercialization)**
  - **Methodology:** Financial and intellectual property auditing conducted by the Technology Transfer Office.
  - **Calculation:** Total number of patents filed annually by teams comprising **≥ 2 different disciplines**
  - **Purpose:** To measure the tangible intellectual-property output generated by interdisciplinary teams.
  - **Target KPI:** ≥ 5 per year
  - **Data Source:** Technology Transfer Office (TTO).
- **4.2b Economic Translation (Commercialization)**
  - **Methodology:** Financial auditing of interdisciplinary research translation into external contracts, grants, and spin-off support.
  - **Calculation:** Total monetary value of industry-sponsored B2B contracts, national grants, or spin-off incubation funding secured by interdisciplinary teams **≥ 2 different disciplines**

- **Purpose:** To measure whether interdisciplinary research is generating real economic value.
- **Target KPI:** Year-on-year growth
- **Data Source:** Technology Transfer Office (TTO).

- **4.3 SDG–Discipline Convergence Rate (THE)**
  - **Methodology:** Joint bibliometric-sustainability mapping using THE field integration and SDG tagging.
  - **Calculation:** (Number of outputs linked to **2 or more SDGs** and assigned to **2 or more THE fields** / Total number of outputs) × 100
  - **Purpose:** To measure how frequently interdisciplinary outputs also address multi-dimensional sustainability challenges.
  - **Target KPI:** ≥ 8%
  - **Data Source:** Elsevier SciVal SDG tagging + THE field mapping.
- **4.4 SDG–Discipline Convergence Rate (ASJC)**
  - **Methodology:** Advanced sustainability-convergence analysis using ASJC field integration and SDG tagging.
  - **Calculation:** (Number of multi-SDG outputs assigned to **2 or more ASJC fields** / Total number of multi-SDG outputs) × 100
  - **Purpose:** To serve as a flagship indicator of interdisciplinary sustainability research by capturing whether multi-SDG publications also exhibit indexed disciplinary diversity.

- **Target KPI:** ≥ 85%
- **Data Source:** Elsevier SciVal SDG tagging + ASJC field classification.

- **4.5 Translational Interdisciplinary Output Rate**
  - **Methodology:** Bibliometric translation analysis based on policy and intellectual-property signals.
  - **Calculation:** (Number of interdisciplinary outputs with **patent-family linkage > 0** or **policy citations > 0** / Total number of interdisciplinary outputs) × 100
  - **Purpose:** To create a publication-linked translation signal complementing the broader commercialization logic of metric 4.2.
  - **Target KPI: ≥ 5%**
  - **Data Source:** Elsevier SciVal / Scopus patent-family and policy-citation fields, cross-validated by TTO

Pillar 5: Institutional Commitment

Objective: To generate data-driven financial and administrative evidence to institutional support to interdisciplinary science and research.

- **5.1 Interdisciplinary Reward Allocation Rate (IRAR)**
  - **Methodology:** A strict financial auditing metric derived directly from the execution of the university's publication incentive bylaw.

- **Calculation Formula:** (Total financial value paid as tiered interdisciplinary bonuses **(10%, 20%, or 40%)** / Total financial value paid for all university publication bonuses) × 100.
- **Purpose:** To provide evidence of institutional financial commitment to interdisciplinary research.
- **Target KPI:** ≥ 35%
- **Data Source:** University Financial Affairs / Delta Publication Portal.

- **5.2 Global Alliance and Leadership Footprint**
  - **Methodology:** Administrative tracking of faculty representation in global science policy making and interdisciplinary governance.
  - **Calculation:** Number of active global board seats, ITD alliance roles, ENIN representations, and comparable international interdisciplinary leadership positions.
  - **Purpose:** To measure the university's transition from local participation to visible global leadership in interdisciplinary science networks.
  - **Target KPI:** ≥ 3 active
  - **Data Source:** University President's Office / FGSAIS Dean
- **5.3 Interdisciplinary Promotion Readiness and Implementation Score (IPRIS)**
  - **Methodology:** An annual institutional audit evaluating the extent to which Delta University's tenure and promotion system is structurally

prepared and operationally implemented to recognize interdisciplinary science research in accordance with the **"Guidelines for the Evaluation and Promotion of Interdisciplinary Research Faculty."** The audit is conducted across all applicable faculties and promotion tracks and assesses both the formal existence and actual implementation of the bylaw's required promotion mechanisms. The assessment should specifically verify the operational presence of the bylaw elements stated in the document, including:

1. interdisciplinary equivalence and premium weighting,
2. activation of SCU interdisciplinary reviewer procedures,
3. bibliometric impact reporting,
4. first-author equivalency for Co-PIs in mega-projects,
5. reward for joint supervision and interdisciplinary grant activity,
6. ecosystem-builder and entrepreneurial capacity-building credits,
7. guaranteed university activity scoring alignment,
8. administrative protection at department and dean levels.

- **Calculation:** Each applicable faculty or promotion track is scored against **8 mandatory implementation dimensions**, with each dimension scored as:

- **0** = absent
- **0.5** = formally stated but not evidenced in implementation
- **1** = formally stated and evidenced in implementation

IPRIS = (Total achieved interdisciplinary promotion implementation points)/ (Total possible interdisciplinary promotion implementation points) X 100

For example, if we assess **5 academics in 2024 who applied for promotion to associate professor or professor**:

maximum possible score = **8 × 5 = 40**

achieved score = **32**

IPRIS = (32/40) X100 = 80%

Where the **8 dimensions** are:

1. **Interdisciplinary Equivalence & Premium Weighting**
   Evidence that interdisciplinary outputs are treated as fully equivalent to traditional outputs, with premium weighting up to 25% where applicable.
2. **SCU Fast-Track and Authorship Maximization Alignment**
   Evidence that the promotion system operationalizes SCU fast-track rules and protects interdisciplinary authorship shares.
3. **Interdisciplinary Reviewer Activation**
   Evidence that the university formally requests cross-disciplinary reviewer panels for interdisciplinary candidates.
4. **Bibliometric and Impact Report Integration**
   Evidence that I-Index, SDG mapping, patent impact, and policy impact reports are appended to promotion cases.
5. **Joint Supervision and Grant Credit Recognition**
   Evidence that interdisciplinary co-supervision and grant activity are formally rewarded in promotion scoring.
6. **Innovation, Patent, and Prototype Recognition**
   Evidence that interdisciplinary patents and product development are recognized at Q1-equivalent or higher value where defined.

7. **Ecosystem Builder and Capacity-Building Credit**
   Evidence that cross-faculty organizing, SDG summits, interdisciplinary conferences, and entrepreneurship/upskilling certificates are credited.
8. **Administrative Protection and Institutional Ratification**
   Evidence that department councils record premium weighting formally and deans ratify the interdisciplinary impact report before SCU submission.

- **Purpose:** To measure the institutional maturity and actual implementation readiness of Delta University's promotion architecture for interdisciplinary science research. IPRIS represents the percentage of interdisciplinary promotion requirements that are actually in place and implemented across the university. This metric intent to merge DELTA-IMPACT framework with national promotion pathways and to ensure that interdisciplinary scholars are not disadvantaged in promotion review.
- **Target KPI:** ≥ 35%
- **Data Source:** University HR Office, Faculty Affairs, Promotion and Tenure Files, Department Council Minutes, Faculty Dean Ratification Records, SCU Submission Files, FGSAIS records, Research Analytics Office bibliometric reports, and Technology Transfer Office documentation.

University President

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