Paper Summary

<!--META_START-->

Title: Development of Actionable Insights for Regulating Students' Collaborative Writing of Scientific Texts

Authors: Christian Hoffmann, Nadine Mandran, Cédric d'Ham, Sébastien Rebaudo, Mohamed Anis Hadd

DOI: https://doi.org/10.1007/978-3-031-16290-9_47

Year: 2022

Publication Type: Conference Paper

Discipline/Domain: Learning Analytics / Educational Technology

Subdomain/Topic: Collaborative Writing, Teacher Dashboards, Educational Collaboration Analytics

Eligibility: Eligible

Overall Relevance Score: 82

Operationalization Score: 90

Contains Definition of Actionability: Yes (via Jørnø & Gynther, 2018 and Martinez-Maldonado et al., 2021

Contains Systematic Features/Dimensions: Yes

Contains Explainability: Partial

Contains Interpretability: Yes

Contains Framework/Model: Yes (Mapping "From Clicks to Constructs")

Operationalization Present: Yes

Primary Methodology: Design-Based Research (Iterative User-Centered Design)

Study Context: Web-based science learning environment (LabNbook) for collaborative writing of scientific

Geographic/Institutional Context: Univ. Grenoble Alpes (France), IMT Atlantique (France)

Target Users/Stakeholders: Teachers in secondary and higher education

Primary Contribution Type: Indicators and visualizations for actionable insights in collaborative writing

CL: Yes

CR: Yes

FE: No

TI: No

EX: Partial

GA: No

Reason if Not Eligible: N/A

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Publication Type: Conference Paper

Discipline/Domain: Learning Analytics / Educational Technology

Subdomain/Topic: Collaborative Writing, Teacher Dashboards, Educational Collaboration Analytics

Contextual Background: The study focuses on supporting teachers in monitoring and regulating stude

Geographic/Institutional Context: Univ. Grenoble Alpes, CNRS, LIG, France; IMT Atlantique, LABSTI

Target Users/Stakeholders: Teachers (secondary and higher education) using OLEs for science educ

Primary Methodology: Design-Based Research (iterative, user-centered design with interviews, focus

Primary Contribution Type: Development of computational indicators and visualizations for CW action

General Summary of the Paper

The paper develops a set of computationally calculable indicators and visualizations to provide teachers

Eligibility

Eligible for inclusion: **Yes**

How Actionability is Understood

Actionable insights are defined (via Jørnø & Gynther, 2018) as "data that allows a corrective procedure, c

> "The challenge for designers of LADs is to provide teachers with actionable group insights defined… as

> "They emphasize the role of a clear 'mapping from low-level data to higher-order constructs…'" (p. 535)

What Makes Something Actionable

- Clear mapping from trace data to meaningful educational constructs
- Relevance to teacher goals (e.g., assessing collaboration strategies)
- Understandable by the intended user (teacher)
- Presented in a way that supports immediate pedagogical decisions

How Actionability is Achieved / Operationalized

- **Framework/Approach Name(s):** Mapping "From Clicks to Constructs"
- **Methods/Levers:** Use of educational sub-constructs (symmetry in action, territorial functioning) deriv
- **Operational Steps / Workflow:**
  1. Collect authorship, timestamp, and version data
  2. Calculate indicators (turn taking, writing time, contribution scores, cowriting score)
  3. Visualize indicators in teacher-friendly timelines and panels
  4. Teachers interpret in context to diagnose collaboration strategy

- **Data & Measures:** Words added (difflib), editor changes, sentence-level overlap detection
- **Implementation Context:** LabNbook platform in science education
> “Our analytics are based on… symmetry in action and territorial functioning… translated… into computa
> “Visualization… allows a teacher to get a wealth of information about how the report was co-constructe
Dimensions and Attributes of Actionability (Authors’ Perspective)
- **CL (Clarity):** Yes — Simplicity and clear indicator definitions stressed (p. 540)
- **CR (Contextual Relevance):** Yes — Indicators tied directly to collaborative writing processes (p. 535
- **FE (Feasibility):** No explicit link
- **TI (Timeliness):** No explicit link
- **EX (Explainability):** Partial — Mapping framework provides interpretability, but some computational s
- **GA (Goal Alignment):** No explicit link
- **Other Dimensions Named by Authors:** Complementarity of indicators, avoidance of aggregation
Theoretical or Conceptual Foundations
- Jørnø & Gynther’s definition of actionable insights
- Martinez-Maldonado et al.’s collaboration analytics model (five-step mapping)
- CSCW constructs: symmetry in action (Dillenbourg, 1999), territorial functioning (Larsen-Ledet & Korsga
Indicators or Metrics for Actionability
- Turn taking (number of editor changes)
- Writing time (active editing time in 30s windows)
- Contribution scores (words added)
- Cowriting score (percentage of sentences modified by multiple authors)
Barriers and Enablers to Actionability
- **Barriers:** Over-aggregation of indicators, complex visualizations reducing interpretability
- **Enablers:** Iterative teacher feedback, complementary indicators, simple visualizations, on-demand d
Relation to Existing Literature
Builds on CSCW collaborative writing strategy distinctions (summative vs integrative), extends Martinez-M
Summary
The authors present a design-based research approach to developing actionable insights for regulating s
Scores
- **Overall Relevance Score:** 82 — Strong conceptual link to actionability, with clear definitions and dim
- **Operationalization Score:** 90 — Comprehensive explanation of how to calculate, visualize, and interp
Supporting Quotes from the Paper

- “[Actionable insights]… ‘data that allows a corrective procedure, or feedback loop…’” (p. 535)
- “They emphasize the role of a clear ‘mapping from low-level data to higher-order constructs…’” (p. 535)
- “Our analytics are based on… symmetry in action and territorial functioning…” (p. 537)
- “Visualization… allows a teacher to get a wealth of information about how the report was co-constructed

Actionability References to Other Papers

- Jørnø & Gynther (2018) — Definition of actionable insights
- Martinez-Maldonado et al. (2021) — Collaboration analytics model
- Dillenbourg (1999) — Symmetry in action
- Larsen-Ledet & Korsgaard (2019) — Territorial functioning in collaborative writing