

Exploring Instructors' Interpretation Patterns with Feedback Dashboards

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Abstract: To support more effective use of learning analytics in teaching, it is important to examine how instructors make sense of analytic information. This study examines how university instructors interpret data presented in a learning analytics feedback dashboard, focusing on the knowledge they activate and the analytic strategies they use. Interview data from 13 instructors were analyzed. Four types of activated knowledge and 10 sensemaking strategies were identified. The results show that instructors' engagement with feedback dashboards is strongly shaped by contextual knowledge, and they frequently interpret feedback by explaining outcomes, relating them to their own beliefs, and drawing on prior teaching experiences. Overall, this study provides an integrative framework for characterizing instructors' sensemaking patterns in learning analytics and advances the theoretical understanding of data-informed teaching practices.

Keywords: sensemaking, feedback dashboard, interpretation

1. Introduction

Understanding how instructors make sense of analytic information is a critical yet underexplored dimension of data-informed teaching in higher education. University instructors typically receive student evaluation of teaching (SET) at the end of each semester, which often includes a mix of numerical ratings and open-ended responses. To help instructors engage with the growing volume of feedback over time, feedback dashboards have been developed to organize SET data into interpretable visual forms, such as charts and graphs (e.g., Hu et al., 2022; Lin et al., 2024, 2025; Pyasi et al., 2018; Wook et al., 2019). Beyond merely presenting information, these tools can influence how instructors attend to patterns, construct meaning, and transform feedback into instructional reflection and pedagogical action. Crucially, this process depends on how instructors interpret the patterns displayed, as these interpretations mediate the translation of analytic information into teaching-related decisions (Li et al., 2022). This study, therefore, aims to examine how instructors make sense of the data and information presented in a feedback dashboard.

Feedback dashboards are a type of learning analytics, designed to support instructors' professional development in teaching. Research specifically examining instructors' use of these dashboards is limited; therefore, this study draws on the broader literature on instructors' engagement with learning analytics to guide our investigation. Some previous research has used teacher noticing framework (van Es & Sherin, 2002; 2008) to examine teachers' use of learning analytics (e.g., van Leeuwen et al., 2019). Two key processes are highlighted in the framework: detection (identifying salient data) and interpretation (making sense of the data in relation to teaching and learning). Another widely used model is Verbert et al.'s (2013) learning analytics process model, which proposes four stages: awareness, reflection, sensemaking, and impact—progressing from noticing data to taking instructional action. Similarly, Wise and Jung (2019) proposed a two-phase model consisting of sensemaking (inquiry and analysis) and response (pedagogical action).

While these studies have identified general patterns in instructors' engagement with learning analytics, the specific sensemaking processes involved in data interpretation remain

underexplored. Building on this line of inquiry, the present study examines how instructors interpret the data and information presented in a feedback dashboard, focusing on the types of prior knowledge they activate and the analytical strategies they employ. Two research questions are addressed.

1. What types of prior knowledge do instructors activate when interpreting dashboard data?
2. What analytical strategies do instructors use during interpretation?

2. Methods

2.1 Feedback Dashboard

The feedback dashboard used in this study is the Student Evaluation Analytics (SEA) Dashboard (Lin et al., 2024; 2025). The dashboard comprises one quantitative feedback page that summarizes teaching evaluation scores and one qualitative feedback page that visualizes thematic and sentiment analyses of students' open-ended comments. It offers instructors an at-a-glance summary of key themes and sentiments, helping them identify strengths and areas for pedagogical improvement.

2.2 Participants

Participants were recruited from instructors who had used the SEA Dashboard. Those who agreed to participate and had at least five semesters of teaching experience were selected to ensure sufficient feedback data for meaningful interpretation. Recruitment continued iteratively until data saturation was achieved, as indicated by the emergence of redundant information across interviews (Morse, 1995). A total of 13 university instructors took part in the study.

2.3 Data Source and Analysis

The primary data for this study were collected through individual, semi-structured interviews with university instructors. Most interviews were conducted online via Zoom, and each lasted approximately 40 to 60 minutes. During the interview, participants were asked to open their SEA dashboard and engage in a think-aloud process while navigating the tool. Examples of prompting questions included: "What data are you noticing?" "How would you interpret it?" and "Are you asking yourself any questions or forming any hypotheses?" All interviews were video recorded and transcribed.

The data analysis was both theory-driven and grounded in data. Informed by Molenaar and Knoop-van Campen's (2019) framework on knowledge activation and Campos et al.'s (2021) typology of educators' responses to visual data, we focused our analysis on how instructors activated prior knowledge and applied analytical strategies while interpreting the dashboard. *Activated knowledge* refers to the pre-existing knowledge instructors drew on to interpret or respond to feedback. *Analytical strategies* are the cognitive or interpretive strategies instructors used to process, interrogate, or derive meaning from the feedback data. The unit of analysis was the *turn of talk*, defined as each instance in which either the interviewer or participant spoke during the conversation.

Using these frameworks as a foundation, we conducted an initial inductive analysis to examine the types of prior knowledge activated and the strategies instructors employed when making sense of the SEA dashboard data. Through an iterative process of labeling, revising, merging, and refining, we developed a coding scheme that captured four forms of prior knowledge: *pedagogical knowledge*, *statistical knowledge*, *knowledge of students*, and *knowledge of context*. Concurrently, we identified ten distinct analytical strategies: *describing data*, *asking questions*, *recalling*, *attributing cause*, *triangulating*, *articulating personal stance*, *comparing*, *evaluating*, *perspective-taking*, and *articulating intent or purpose*. We applied the coding scheme to all participants' responses and calculated the frequency of each code per participant (Chi, 1997).

To establish interrater reliability, a second rater was trained on the coding scheme and independently coded 20% of the dataset. Percentage agreement was calculated for each category: agreement for prior knowledge codes ranged from 82.5% to 92.5%, while agreement for analytical strategy codes ranged from 80% to 100%, indicating reliability ranging from satisfactory to high. Discrepancies were resolved through discussions.

3. Results

Table 1 shows the descriptive statistics of instructors' activated knowledge and analytical strategies. In general, *knowledge of context* was the most frequently activated knowledge (82 occurrences), suggesting a tendency from instructors to rely on contextual information—such as course structure or student background—when interpreting feedback.

In terms of analytical strategies, the most prevalent were *attributing cause* (56 occurrences), *articulating personal stance* (51 occurrences), and *recalling* (48 occurrences). This pattern suggests that instructors often make sense of feedback by explaining its possible causes, linking it to their own beliefs or teaching philosophy, and referencing specific teaching episodes from memory.

Overall, these findings indicate that instructors' interpretations were not purely data-driven but were closely shaped by their personal experiences and situated understanding of the teaching environment.

Table 1. *Frequency count of interpretation patterns*

Dimension	Code	Count
Activated Knowledge	Pedagogical knowledge	20
	Statistical knowledge	20
	Knowledge of students	53
	Knowledge of context	82
Analytical Strategy	Describing data	42
	Asking questions	25
	Recalling	48
	Attributing cause	56
	Triangulating	6
	Articulating personal stance	51
	Comparing	12
	Evaluating	29
	Perspective-taking	14
	Articulating intent/purpose	19

4. Discussion

While teacher dashboards offer valuable support for instructional decision-making, their effectiveness depends not only on the usability of the tool but also on how instructors engage with and interpret the data it presents. This study examined how university instructors interpret data from a feedback dashboard to reflect on their teaching practices.

We identified four types of activated knowledge (i.e., *pedagogical knowledge*, *statistical knowledge*, *knowledge of students*, and *knowledge of context*) and ten analytical strategies (i.e., *describing data*, *asking questions*, *recalling*, *attributing cause*, *triangulating*, *articulating personal stance*, *comparing*, *evaluating*, *perspective-taking*, and *articulating intent or purpose*) that instructors employed when interpreting data in the feedback dashboard.. While prior research, such as Wise and Jung's (2019) two-phase framework, broadly categorizes data interpretation into "read" and "explain" phases, our findings offer a more granular account of the specific strategies instructors employ. Furthermore, this study extends Campos et al.'s (2021) work by integrating types of activated knowledge with analytical strategies, thereby providing a more comprehensive understanding of instructors' interpretive

processes. This integrated framework provides a foundation for future research on instructors' sensemaking processes with learning analytics.

Our preliminary results suggest that instructors' engagement with feedback dashboards is strongly shaped by contextual knowledge. Instructors frequently explain feedback outcomes, relate them to their own beliefs, and draw on prior teaching experiences to make sense of the data. It indicates that sensemaking is situated and deeply intertwined with personal perspectives/beliefs and experience. Future research could further examine how these interpretation patterns influence the quality of instructional decisions, and how factors such as data literacy and familiarity with analytics tools shape interpretation.

This study is part of an ongoing research project. Building on these preliminary findings, we will further examine how the identified interpretation patterns relate to other variables, such as teaching evaluation scores and pedagogical decision-making. As an exploratory study, our analysis is based on data from 13 instructors at a single institution. Future research could extend this work by using larger, more diverse samples across multiple contexts to validate, refine, and potentially expand the identified patterns.

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