Facilitating Sensemaking in Learner-centric Feedback with NLP

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What is learner-centred feedback?

Feedback is information that is given to a learner about his or her progress in achieving the learning objectives of the course.

- Learner-centred feedback promotes learning and enables the student to achieve the desired learning goals.
- However, it is unclear how efficiently feedback practices have adopted frameworks of learner-centred feedback.
- It is important to bridge the gap between the researched understanding of feedback and real-world feedback practices.
- The components of learner-centred feedback are:
 - Sensemaking
 - Future Impact
 - Support Agency (Ryan et al., 2021)

Why study sensemaking first?

Enable Constructive Alignment

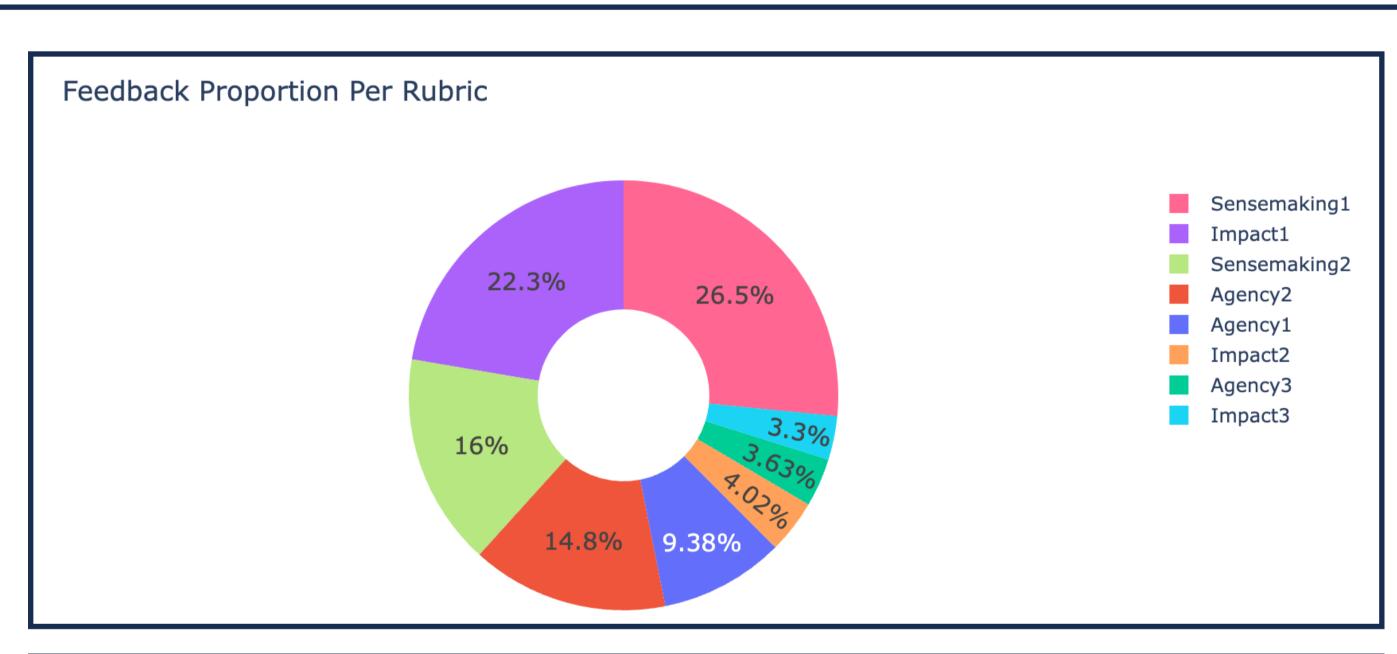
 Sensemaking is critical to ensure that feedback aligns with learning outcomes.

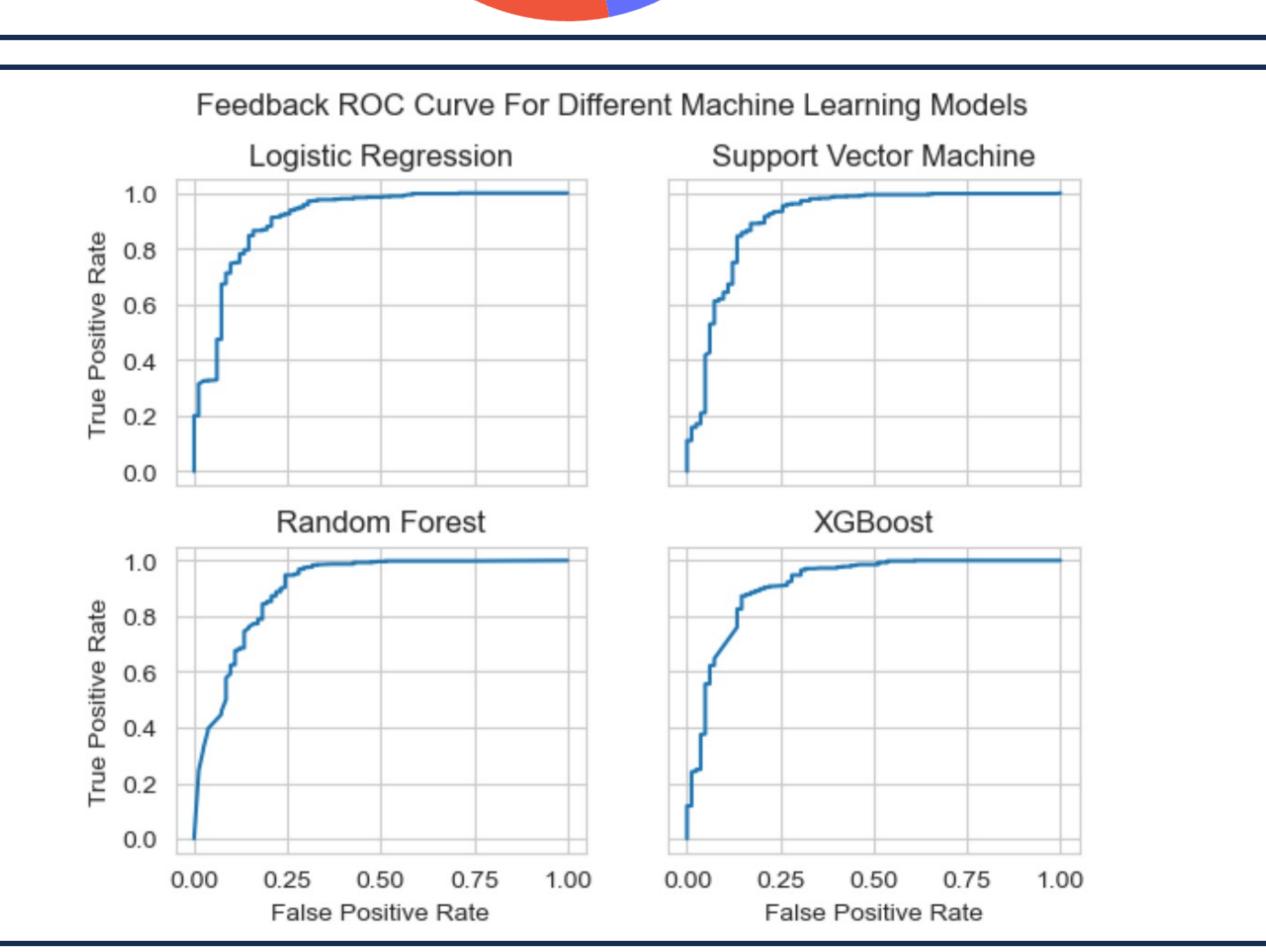
Activate Cognitive Dimensionality (Yang & Carless, 2013)

- Sensemaking addresses the student's performance specifics, eg, strengths and weaknesses (Ryan et al., 2021).
- It jump-starts the process of awareness, engagement and learning with the student.
- By highlighting the strengths and weaknesses, sensemaking deals with the learning process's cognitive (Yang & Carless, 2013) enhancement.

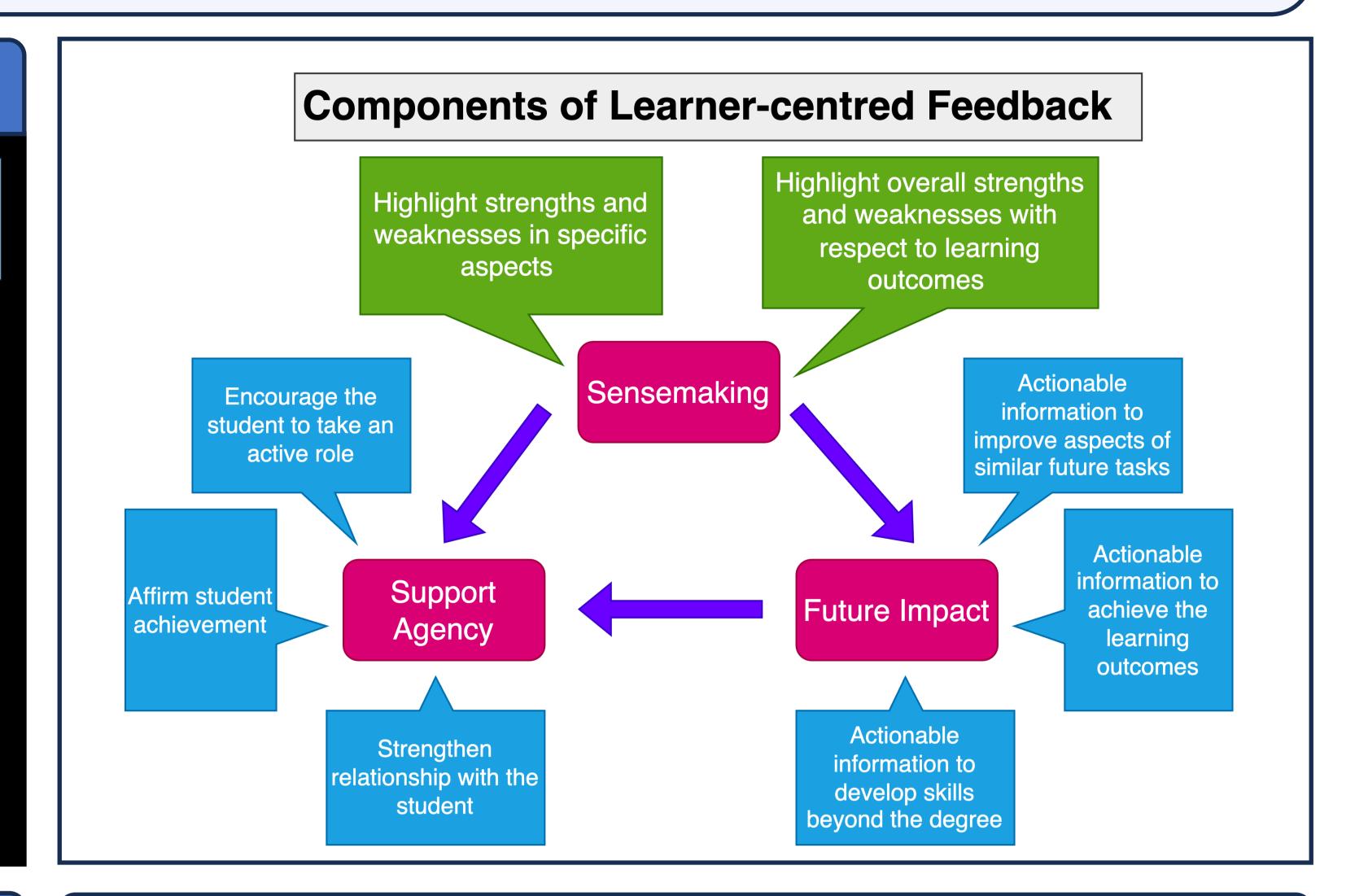
Facilitate Future Impact

• Sensemaking provides context to support the actionable information being provided in future impact comments (Ryan et al., 2021).









How did we go about this study?

Labelling the Data

- We labelled a randomly sampled feedback dataset as per the characteristics of learner-centred feedback (Ryan et al., 2021).
- The labelling process was validated with an inter-rater reliability test score of 0.83.

Analyzing the Feedback

Descriptive and inferential statistics were used to observe the extent to which feedback pieces adhered to learner-centric principles.

Predicting Sensemaking

 We used feature extraction methods and NLP models to understand the extent to which they can identify the sensemaking aspects in feedback text.

What did we find?

Key Feedback Insights

- Around 27% of the analyzed feedback pieces contained the first Sensemaking (Ryan et al., 2021) rubric, making it the most prevalent rubric.
- The most common verbs used in Sensemaking (Ryan et al., 2021) comments were 'miss', 'use' and 'need'.
- Almost 15% of individual feedback comments contained a combination of the first rubric from Sensemaking and Future Impact.

Sensemaking Classification Highlights

- Multiple models were able to identify the presence of the sensemaking (Ryan et al., 2021) component with a minimum accuracy of 0.85.
- A near-perfect ROC curve was achieved for the machine learning models.

What are the future implications?

- A quantifiable way to measure learner-centred feedback, irrespective of student performance.
- The promising step towards developing actionable feedback recommendation systems for tutors in higher education institutions.
- Overcome possible biases of student feedback from sources such as Monash SETU.

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Ryan, T., Henderson, M., Ryan, K., & Kennedy, G. (2021). Identifying the components of effective learner-centred feedback information. *Teaching in Higher Education*, *0*(0), 1–18. https://doi.org/10.1080/13562517.2021.1913723