

Modelling student participation using discussion forum data

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INTRODUCTION:

- Course **discussion forums** are widely used in many learning environments
- Increasingly, instructors cannot monitor all the students all the time
- Identifying **depth and quality of participation** automatically from forum messages could help direct attention where it is most needed

APPROACH:

1. Build on two widely-studied frameworks for critical discourse: **Community of Inquiry** and **ICAP**
2. Automate labelling of new data using natural language processing (NLP) and machine learning

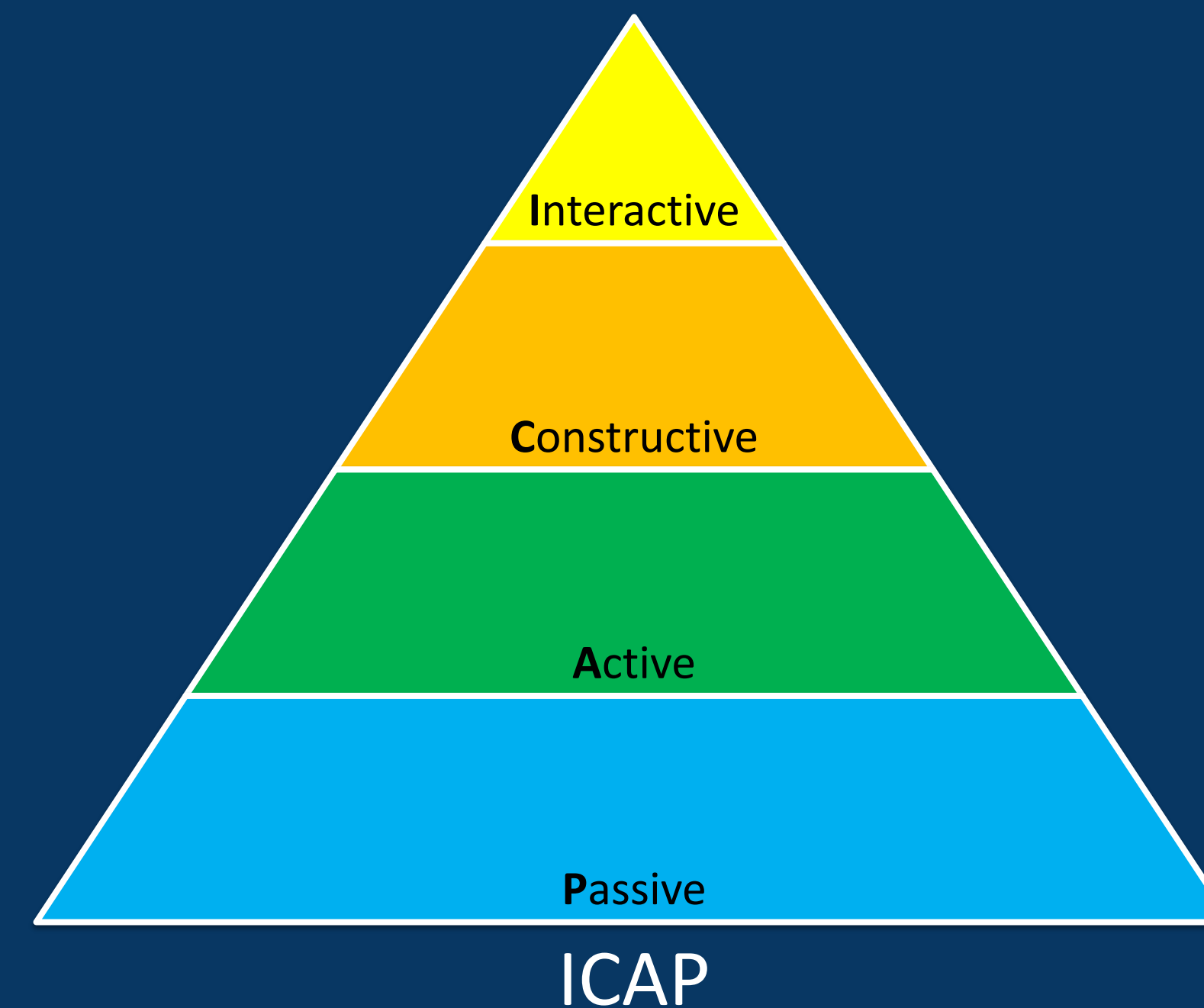
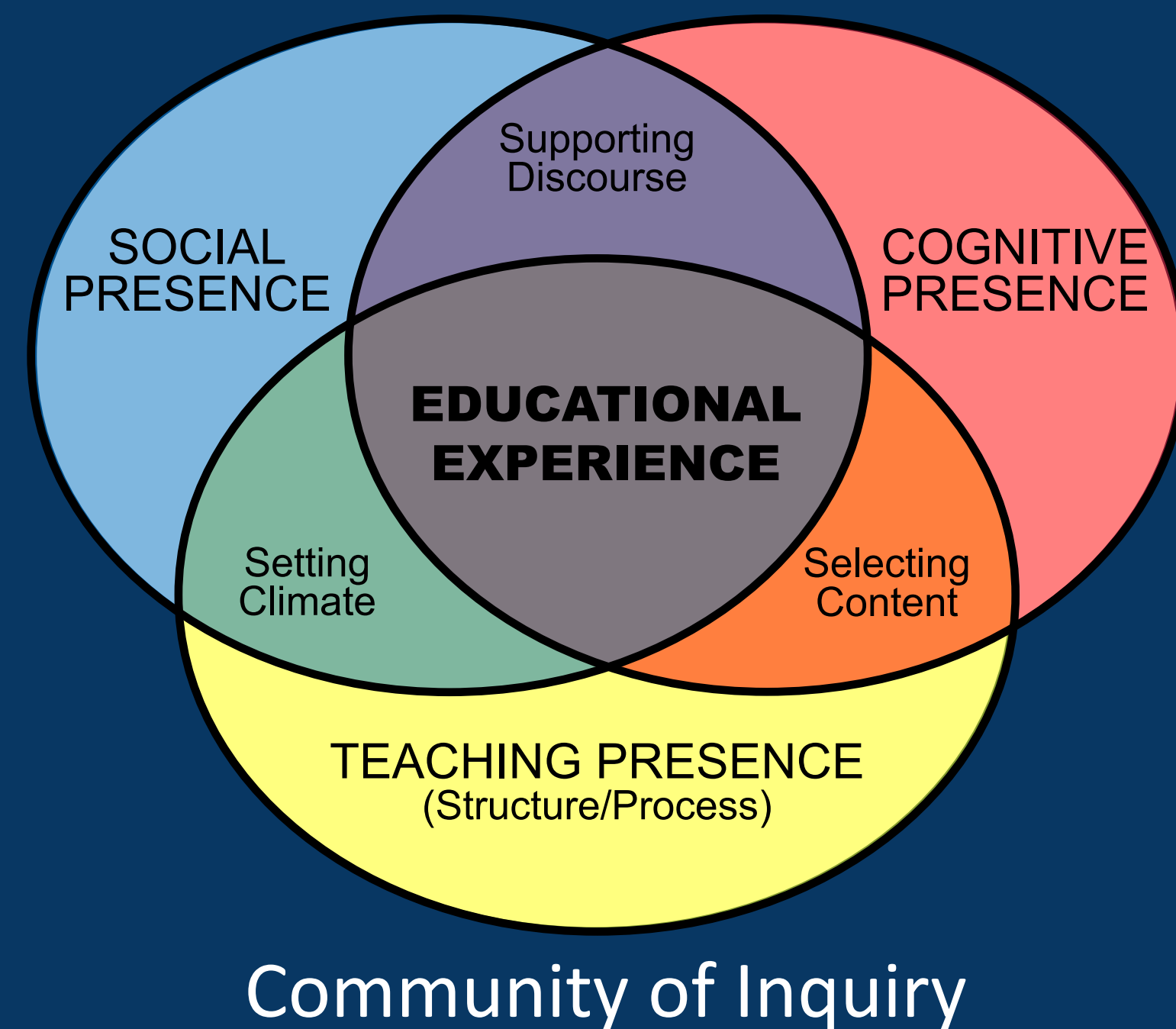
RESEARCH QUESTIONS:

1. Do the two frameworks provide complementary insights?
2. Can the NLP models assign labels as well as prior work?
3. Can such models tell us which aspects of a message most affect the labelling decision?
4. Does learning labels from both frameworks together improve overall performance?

PROGRESS MADE:

1. Data labelled by two coders using adapted + extended ICAP taxonomy
2. Initial data study accepted to LAK'20
3. Conceptual and empirical framework comparison underway

How can we identify and model the depth and quality of student participation using discussion forum messages?



Theoretical framework labels

Community of Inquiry: phases of cognitive presence

Triggering Event	The initial question that sparks a discussion
Exploration	Many new ideas are being considered
Integration	Ideas begin to coalesce into a more coherent form as connections are identified
Resolution	A conclusion has been reached, perhaps in the form of a hypothesis that can be tested
Other	No signs of cognitive presence

(Garrison et al., 2000)

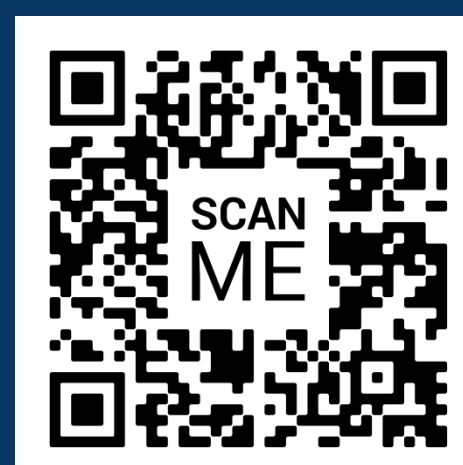
ICAP: modes of cognitive engagement

Interactive	Displaying explanation or reasoning about the current topic in response to an earlier message
Constructive	Displaying explanation or reasoning about the current topic; introducing new content to the discussion
Active	Referencing specific previous content; showing signs of being engaged with course content
Passive	Reading messages without responding
Off-task	Commenting without any relation to the current topic or the course

(adapted from Yogev et al., 2018)

FEEDBACK REQUESTED:

1. Are there **other frameworks** that measure latent constructs related to learning?
2. Are there **other data sets** that have already been labelled using either of the frameworks?



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