

Examining the Positioning of Ideas in the Disciplines



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Enabling Productive Discussion

Productive Discourse is Supported By [1-3]:

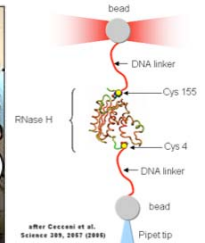
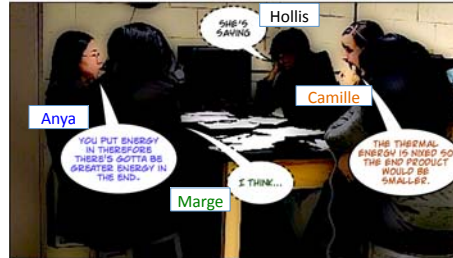
- Genuinely considering individual ideas
- Spending time with weak or incomplete ideas
- Maintaining a shared framing of the activity

How do the interactional moves of 'quiet' students support productive discussion?

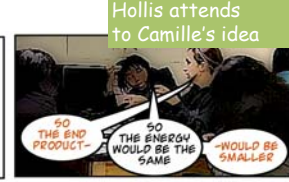
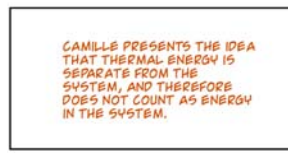
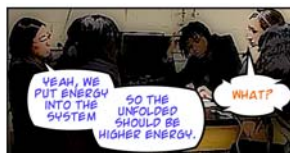
Context

- Anya, Camille, Marge, and Hollis working on a collaborative group problem-solving task
- Enrolled in a reformed Physics for Life Science Majors class [4]
- The course context encourages connections between physics, chemistry, and biology

Question students are discussing: Is the energy of the **unfolded** RNase protein **smaller** or **larger** than the energy of the **folded** RNase protein?

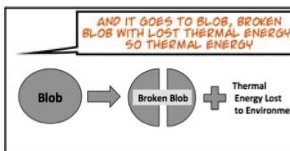
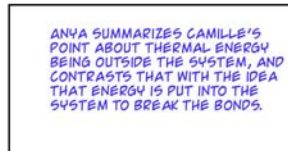


The Discussion



Hollis voices Anya's idea

Marge supports Camille's idea



Anya uses ideas of endothermic reactions

Hollis extends Anya's idea

Conclusion: Positioning Ideas with Value Contributes to Productive Discourse

Marge and Hollis position ideas as having value to the conversation



Anya positions ideas with authority from outside physics



Productive Discourse

- Marge extends the idea of energy input by asking where the input occurs
- Hollis voices the idea that energy is required to break bonds
- Hollis completes the idea that thermal energy is lost from the system
- Marge refocuses the discussion on the idea that energy is less in the unfolded protein

- Language of delta-H
- Reasoning with 'endothermic'

- Genuinely considering individual ideas
- Spending time with weak or incomplete ideas
- Maintaining a shared framing of the activity

References

- [1] B. Barron, *J. Learn. Sci.* 12, 307 (2003).
- [2] K. Hogan, B.K. Nastasi, and M. Pressley, *Cognition Instruct.* 17, 379 (1999).
- [3] R.E. Scherr, and D. Hammer, *Cognition Instruct.* 27, 147 (2009).
- [4] For more information on the course, see <http://go.umd.edu/s284>

Acknowledgments

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