Use of 3D simulation models to enhance student engagement in a food science class

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Outline

- Challenges in an introductory level food science class
- Application of 3D models to increase engagement
- Final thoughts

Current challenges

- Approximately 40% of the students enrolled in the Fundamentals of Food Science course have limited background in chemistry

- We have observed that non-science students have difficulty in understanding the science concepts

Current challenges

Students studying the effects of pH on protein denaturation and enzymatic activity

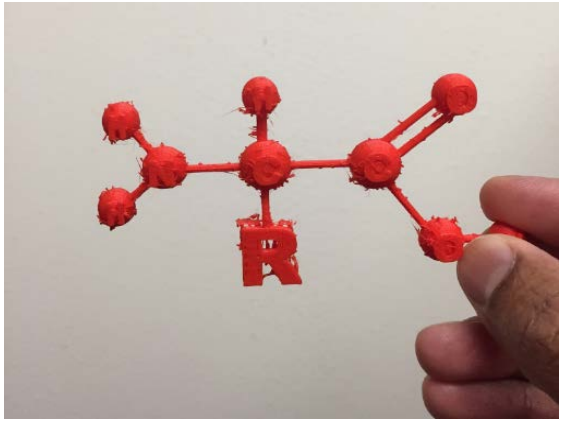
Objective

- To develop interactive simulation models to promote and enhance student engagement in a food science freshman class

Methodology

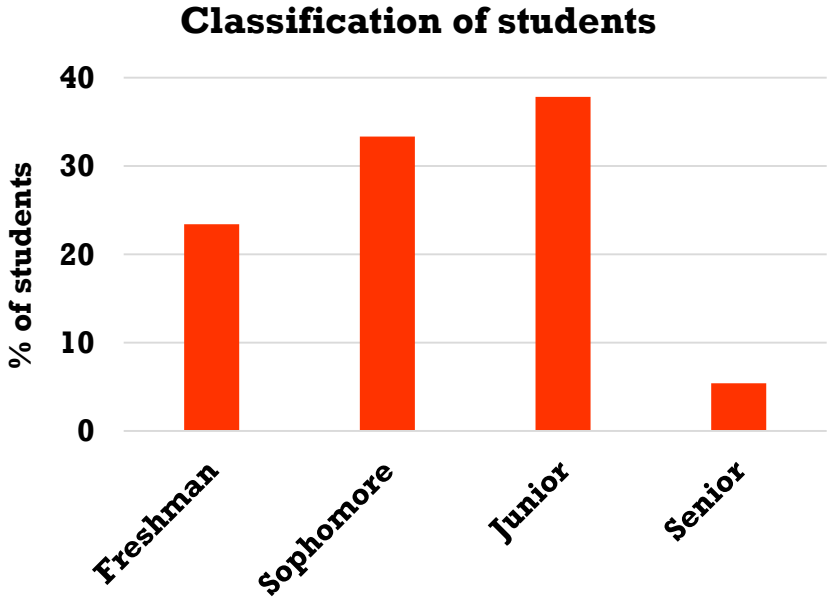
- Data were collected during fall 2017 from the students enrolled in Fundamentals of Food Science (FDSC 1133; freshmen level; 125 students)
- Five 3D models were printed using a 3D printer
- The models were assigned to a group of six students
- The effectiveness of 3D models in student engagement was assessed using an optional survey given at the end of the semester on a scale of 1 to 5

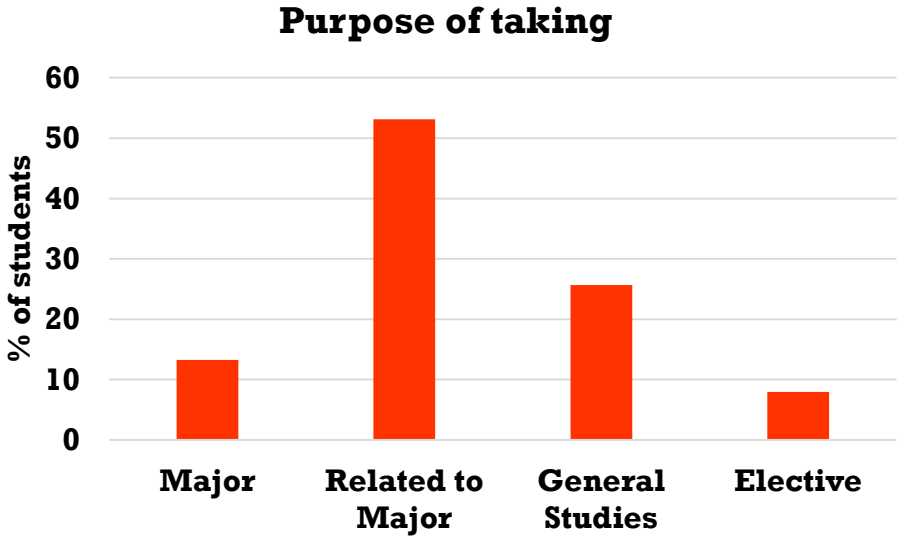
Methodology



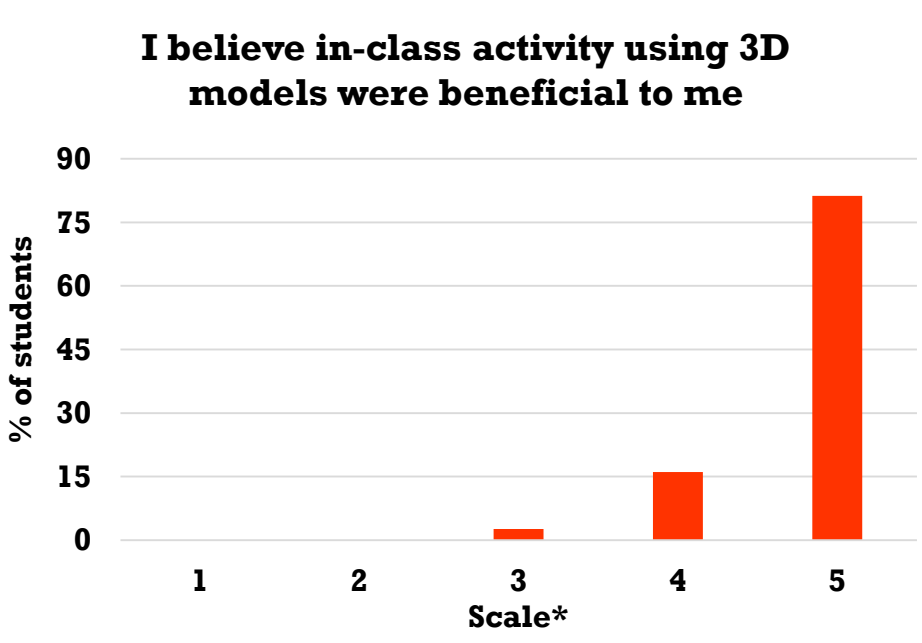
Examples of 3D models used in class

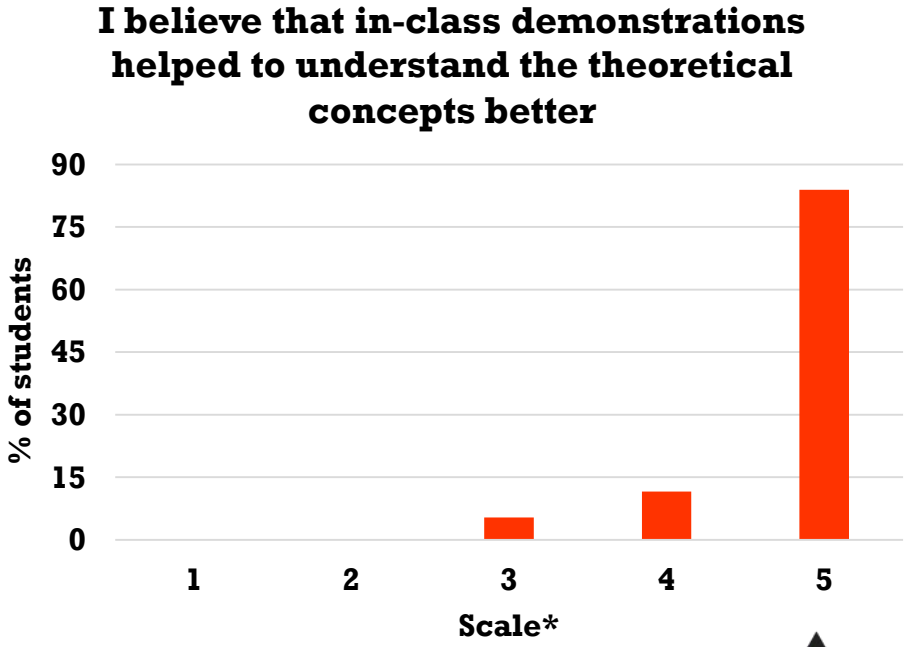
Results


Classification of students
% of students
40
30
20
10
0
Freshman
Sophomore
Junior
Senior


Purpose of taking
% of students
60
50
40
30
20
10
0
Major
Related to Major
General Studies
Elective

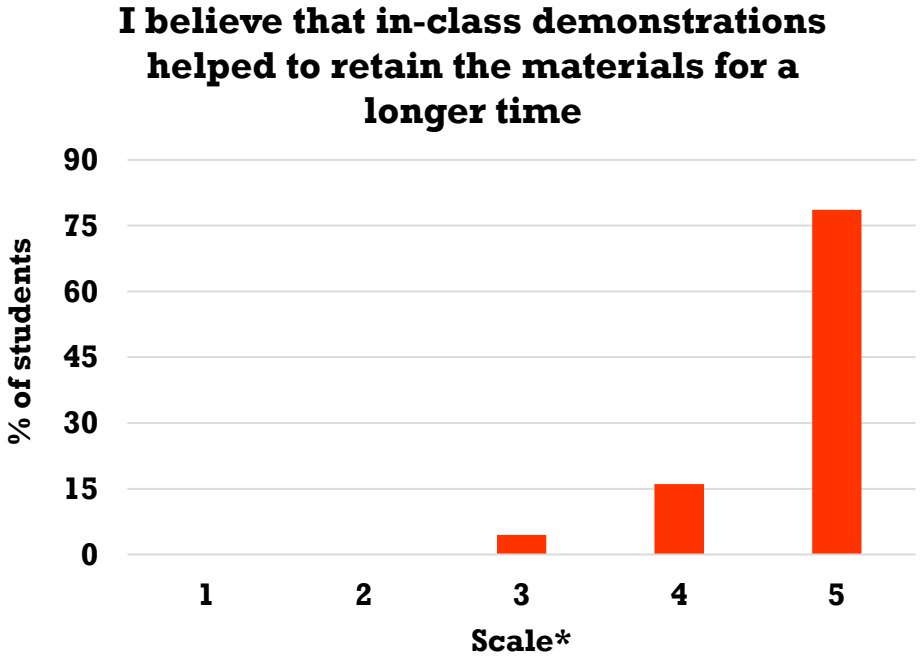
Results

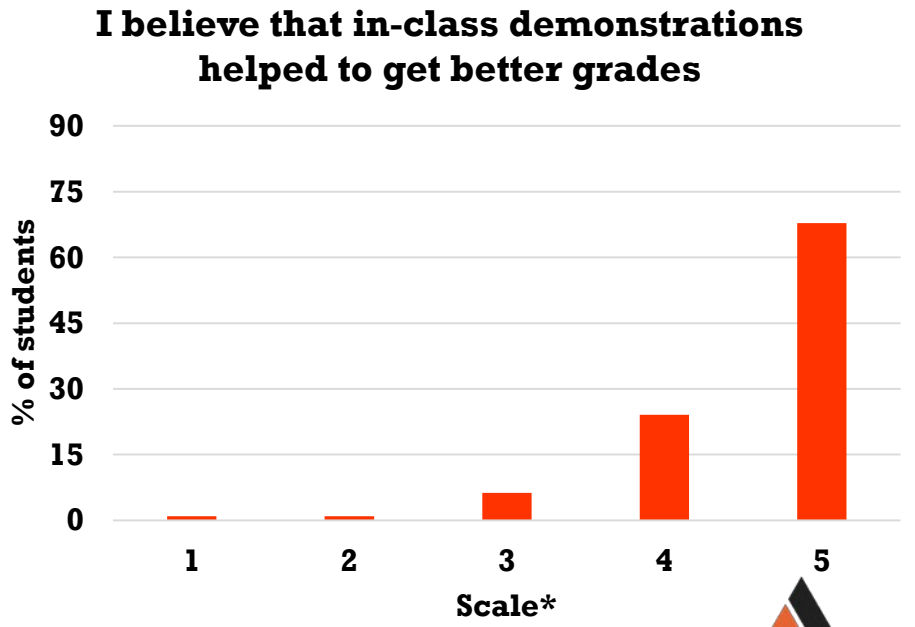




*1=Not true at all, 5=Very True

Results





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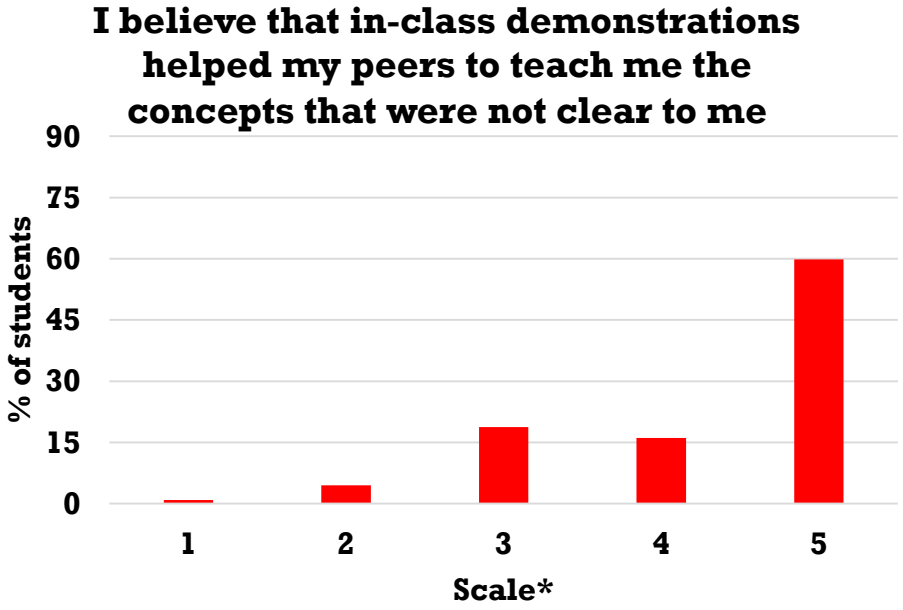
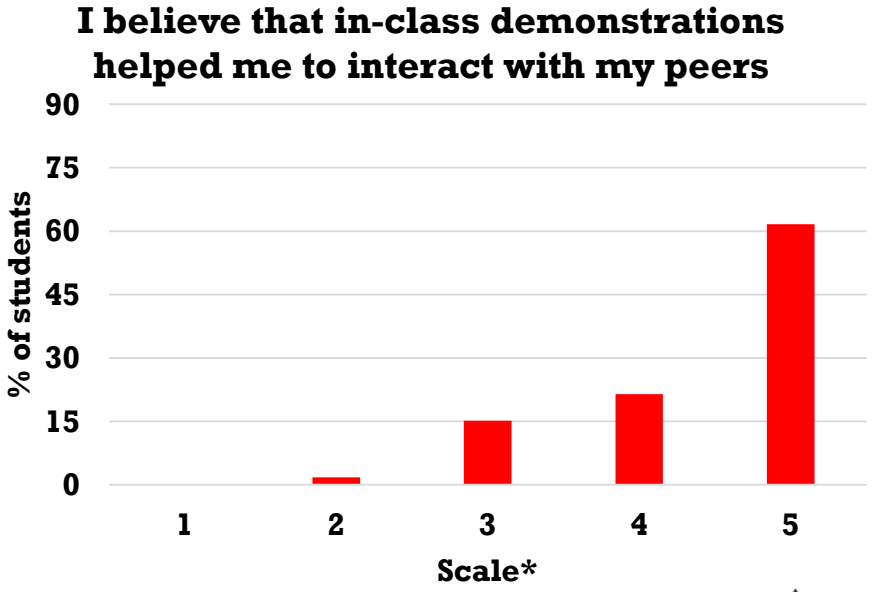
Results





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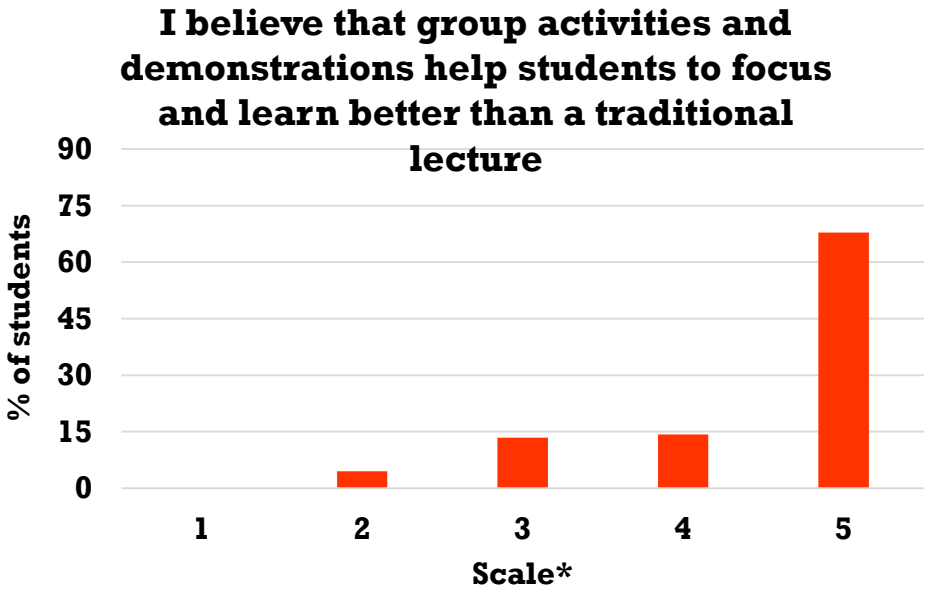
Results



*1=Not true at all, 5=Very True

- 3D models helps to understand concepts better
- Potential interactive tool that can be implemented in any classroom settings
- Not very expensive

Final thoughts

- Non-science students were able to use more technical terms to explain the concepts
- Future studies will compare the effects of 3D models on overall grade and retention of materials
- Experiential learning is an effective method to increase interaction and enhance overall learning experience

Thank you for your attention!

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