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

- Freshman
- Sophomore
- Junior
- Senior

Purpose of taking

- Major
- Related to Major
- General Studies
- Elective
Results

I believe in-class activity using 3D models were beneficial to me

<table>
<thead>
<tr>
<th>Scale*</th>
<th>% of students</th>
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<tbody>
<tr>
<td>1</td>
<td>15</td>
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<tr>
<td>2</td>
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<td>3</td>
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<td>4</td>
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<td>5</td>
<td>75</td>
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*1=Not true at all, 5=Very True

I believe that in-class demonstrations helped to understand the theoretical concepts better

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<td>1</td>
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<td>5</td>
<td>90</td>
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*1=Not true at all, 5=Very True
Results

I believe that in-class demonstrations helped to retain the materials for a longer time

I believe that in-class demonstrations helped to get better grades

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

I believe that in-class demonstrations helped my peers to teach me the concepts that were not clear to me

I believe that in-class demonstrations helped me to interact with my peers

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

I believe that group activities and demonstrations help students to focus and learn better than a traditional lecture

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

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