Modeling Applied Mindtool Experiences with Hyperlinked Presentation Software

By: Stephenie Schroth

1. Databases: tools for analysis of content domain.

- 2 levels of analysis:
  1) Analytical: Students seek out and organize information in the database.
  2) Reflective and relational: Students ask questions about information in the database.
2. Concept Maps: can and should guide studying.

- Students select 20-25 important concepts from a chapter and construct a good concept map.
- This tool allows students to perform better on examinations.
I am a chef. I use fractions everyday on the job.

My job involves measuring:
- 1/2 teaspoon
- 3/4 tablespoon
- 2 1/3 cups

Sometimes, I make more or less of something than usual. So, I have to:
- Add fractions
- Subtract fractions
- Multiply fractions
- Divide fractions

So, if I want to be successful and do my job right, understanding fractions is really important.

If I don't measure correctly or figure out just how much of something I need to add into a mixture when I cook, then the food I make won't taste very good.

If my food doesn't taste good, I might lose my job or go out of business.

People who go to my restaurant count on the food tasting great. If I add too much flour or not enough salt, the food might turn out too dry or flavored enough.

- Through building and executing equations with a spreadsheet, learners can build quantitative models.
- It allows the learners to construct a better understanding of casual relationships, which are the basis of almost all scientific reasoning.
4. Visualization Tool: support different kinds of investigations.

- Many learners are visual learners; they have to see something before they can understand it.

- For some students, a picture may be worth a thousand words.
5. Hypermedia: multimedia programs that are hyperlinked together.

Hyperlinking of individual nodes or chunks of information can be used by learners to illustrate the complexity and interrelatedness of domains they are studying.
1. Concept Maps: Concept maps are used for identifying components, but they cannot represent the dynamic nature of interactions.
2. Modeling Tools: Students construct dynamic systems models by describing the quantitative relationships among the components, then testing them by running the model.
3. Spreadsheets: Spreadsheets are effective for illustrating dynamic interaction among system components.

- It enables students to test their hypotheses.
Model 3 (Spreadsheet):
The concept of fractions is a difficult concept for students to understand. Students can create a spreadsheet to assist with organizing and synthesizing data. For example, students can use spreadsheet software as a mindtool to offset the cognitive load by computing and graphing fractions.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/4</td>
<td>3/4</td>
</tr>
<tr>
<td>2</td>
<td>1/8</td>
<td>7/8</td>
</tr>
<tr>
<td>3</td>
<td>1/16</td>
<td>15/16</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Pie charts showing fractions](chart.png)
1. Databases:

- Tables in relational databases can be searched, together, to answer queries, which are formal searches in a database that can be predefined in the database program.
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>Number</td>
<td>one half</td>
</tr>
<tr>
<td>1/4</td>
<td>Number</td>
<td>one fourth</td>
</tr>
<tr>
<td>3/5</td>
<td>Number</td>
<td>three fifths</td>
</tr>
<tr>
<td>5/8</td>
<td>Number</td>
<td>five eighths</td>
</tr>
<tr>
<td>7/9</td>
<td>Number</td>
<td>seven ninths</td>
</tr>
<tr>
<td>15/16</td>
<td>Number</td>
<td>fifteen sixteenths</td>
</tr>
<tr>
<td>17/18</td>
<td>Number</td>
<td>seventeen eighteenths</td>
</tr>
<tr>
<td>39/40</td>
<td>Number</td>
<td>thirty-nine fourteenths</td>
</tr>
</tbody>
</table>

Field Properties:

- **Field Size**: Long Integer
- **Format**: 
- **Decimal Places**: 2
- **Input Mask**: 
- **Caption**: 
- **Default Value**: 
- **Validation Rule**: 
- **Validation Text**: 
- **Required**: No
- **Indexed**: No
- **Smart Tags**: 

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.
2. Concept Maps:
- Concept maps can assist students with beginning to solve a problem.
- The generation of a concept map can provide the organization required to solve the problem.
- It is a shorthand form of organizing and sequencing ideas.
3. Spreadsheets:
- Spreadsheets can help build numeric models of a laboratory problem.
- Spreadsheets can display data and information either quantitatively or qualitatively.
- Spreadsheets can model nearly all phenomena in mathematics and science.
4. Expert Systems:

- Expert systems use casual reasoning/casual relationships in problems they are solving.

- Students become the authorities instead of the teacher, which promotes deeper thinking about the subject.
5. Modeling Tools

- Modeling tools are used to model dynamic, feedback-driven systems.
- Modeling tools display both qualitative and quantitative representations of the problems.
- Modeling tools check accuracy of equations.
6. Visualization Tools:

- Because many scientific problems, especially in mathematics, are abstract and difficult for learners to comprehend, visualization tools are utilized.

- Chemistry problems also present difficulties because many of the processes are not visible.
1. Databases:
   - Databases enhance conceptual change.
   - Databases model people’s experiences, which is referred to as ethnography.
   - Databases can be used to collect stories about their experiences, to index them, and to store them.
   - Databases enable the learner to search or to sort on any field to locate similar cases or results.
2. Hypermedia:

Hypermedia allows students to tell stories about people, such as through biographies, documentaries, or ethnographies.
This is an example of a Hypermedia presentation that is used to demonstrate experiences. The students can use Microsoft PowerPoint to create a presentation of their research findings.
1. Expert System:
   - Expert systems are intelligent tutoring systems.
2. Systems Dynamics Tools:

- Systems dynamics tools are cognitive simulations.