Explaners of the Universe

http://explorers.tsuniv.edu

EXPLORERS OF THE UNIVERSE
A Project Exploring Scientific Literacy

Explorers of the Universe: Interactive Electronic Network

MUSPIN Ninth Annual Users’ Conference

Center of Excellence in Information Systems
Tennessee State University
Nashville, Tennessee

September, 1999
Session Focus

- Overview
  - Marino Alvarez

- Components of Interactive Electronic Network
  - Goli Sotoohi

- Classroom Applications of Concept Maps and Notebooks
  - Michael Busby

- Mediating the Learning Process
  - Geoff Burks

- CASS Program
  - Montanez Wade

- Student Project
  - Tiffani Cannon

- Questions
Overview

▶ The focus of the project is on scientific literacy. How students and teachers become **Communities of Thinkers**.

  → An active group of students and teachers striving to learn more about a discipline by engaging in critical and imaginative thinking.

▶ This scientific/literacy interdisciplinary project is designed to stimulate an interest in earth/space science within middle, secondary, and postsecondary students.

▶ This project investigates ways in which students actively participate and learn science in a collaborative format with their teachers, university educators, community resources, and practicing scientists.

▶ The project explores the use of **interactive technology** within middle and secondary schools. The **World Wide Web** and the **Internet** are used as a research tool in gathering basic information, as a method of disseminating research results, and as a form of communication between scientists, teachers, and students.
Three affiliated projects/investigations:

1. Astronomy - Variable Stars (Tennessee State University)
2. Mars Orbiter Laser Altimeter (MOLA) (Goddard Space Flight Center)
3. Vegetation Canopy Lidar (VCL) (Goddard Space Flight Center)
Explorers of the Universe: Interactive Electronic Network

- A Restricted portion of the web site entitled Gateway
- Requires Username and Password.
- Consists of a Student Console, Teacher Console, Researcher Console, Library, Bibliographic File, Electronic Notebook, and Portfolio.
- Designed to provide interactive exchanges with metacognitive tools for learning.
- Being used by students at affiliated high schools, NASA CASS undergraduate students at TSU, and piloted with graduate and undergraduate students at TSU’s College of Education and College of Arts and Sciences.
Academic Year 1998-99 Presentations


Cepheid Variable Star Research Report"
Bryant Mayne, B.J. Stein, & Clay Capp - University School of Nashville, TN.
"Super Nova Search"
Peter DuPont - University School of Nashville, TN
"Crab Nebulae and its Expansion Rate"
Katie Allen & Anne Wilson - University School of Nashville, TN
"Active Galectic Nuculei"
Allison Cate - University School of Nashville, TN
"Satellites and Communication"
Jodie Friedman - University School of Nashville, TN.
"Comets, Planets, Meteor Showers, History, and Art"
Nicole Adcox & Amelie Heber - Hunters Lane High School, Nashville, TN
"Revealing Ideas with Visual Representations"
Willin Diaz & Hiram Morel - George Washington High School Campus, New York City.
"Using Self-Drected Cases: CDs for Literacy Development"
Sarah Miller - Brentwood High School, Brentwood, TN
Metacognitive Tools: Concept Maps and Vee Diagrams

- Students construct **Concept Maps** that reveal their ideas for formulating their case research.

- Students develop **Vee Diagrams** that enable them to plan, carry out, and report their research findings.
Concept Maps consist of a series of concepts, as noted by a circle.

Links represent direct relationships between concepts.

Each link is labeled with a word or word phrase that explains the relationship between the concepts.

Cross-links (broken lines) represent a relationship between other concepts represented on the concept map.
Gowin’s Vee showing epistemological elements which are involved in the construction or description of new knowledge. All elements interact with one another in the process of constructing new knowledge or value claims, or in seeking understanding of these for any set of events and questions.


CONCEPTUAL/THEORETICAL  
(Thinking)  

WORLD VIEW:  
The general belief system motivating and guiding the inquiry.

PHILOSOPHY:  
The beliefs about the nature of knowledge and knowing guiding the inquiry.

THEORY:  
The general principles guiding the inquiry that explain why events or objects exhibit what is observed.

PRINCIPLES:  
Statements of relationships between concepts that explain how events or objects can be expected to appear or behave.

CONSTRUCTS:  
Ideas showing specific relationships between concepts, without direct origin in events or objects.

CONCEPTS:  
Perceived regularity in events or objects (or records of events or objects) designated by a label.

EVENTS AND/OR OBJECTS:  
Description of the event(s) and/or object(s) to be studied in order to answer the focus/research question.

FOCUS/RESEARCH:  
QUESTIONS

METHODOLOGICAL  
(Doing)  

VALUE CLAIMS:  
Statements based on knowledge claims that declare the worth or value of the inquiry.

KNOWLEDGE CLAIMS:  
Statements that answer the focus or research question(s) and are reasonable interpretations of the records transformed records (or data) obtained.

TRANSFORMATIONS:  
Tables, graphs, concept maps, statistics, or other forms of organization of records made.

RECORDS:  
The observations made and recorded from the events/objects studied.
Explorers of the Universe
http://explorers.tsuniv.edu

By Goli Sotoohi

- Web Site Overview
- Student Console
- Teacher Console
- Researcher Console
- Data Analysis
Interactive Process Via the Internet

- Conducts Research
- Collaborates with teachers, researchers, scientists
- Creates a case

**Teachers Researchers Scientists**

**Server Manager**

- Transferred to and saved on

**Teacher**

- Manages
- Supervises

**Student**

- Feedback

- All data are accessible via the website
- Questions, suggestions, comments...

Metacognitive Tools
The home page of the Explorers of the Universe displays the areas where the general public can browse.

**Gateway**

This button links students, teachers and researches that are members of the Explorers of the Universe project to visit a restricted section. This link requires a username and password.
Welcome to the Explorers of the Universe Student Gateway. The Gateway is a secured area of the Explorers website for teachers and students involved in the Explorers project. This is a RESTRICTED area. Please enter your username and password below.

Gateway Login
Students, teachers, and researchers use their username and password to enter this restricted site.
Student Console

The buttons at the left margin enables the student to work with:

- A Vee Diagram Form
- A Page to upload Concept Maps
- An Electronic Notebook
- A Portfolio that keeps a record of every work you submit
- A File Folder to upload any file format.
- A Library that contains reference and resource information such as student research reports, documents, articles, adjunct teaching aids, and action research strategy.
- A Personal Information section containing personal information.
You may start a New Vee Diagram or go to your Portfolio to edit an existing Vee Diagram. Follow the Steps for Creating and Editing Vee Diagrams when entering information on the Vee Diagram. To learn more about the Vee Diagram, read below.

**About the Vee Diagram**

This Vee Diagram is used to plan, carry out, and finalize your case investigation. Each element on the Conceptual and Methodological sides of the Vee are given below. The CD Case Guide contains pertinent information and animations for the Interactive Vee Diagram, Concept Mapping, and Action Research Strategy. Review and follow the Action Research Strategy to help you during these stages. Also, refer to your Case Concept Map that you constructed. The Vee Diagram will help you revise and complete your Case Concept Map.

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**Vee Diagram**

The Vee Diagram page has basic information about the vee diagram, links that will take you to the Vee diagram form, and steps for creating one.
The Vee Diagram form is a template for you to fill all or some of the fields and then either save the form to your portfolio for later entries or to submit the form to our server for review.

At the top of the page the form contains four (4):

- **Entry Form** presents the vee diagram form.
- The **View Vee** (eye ball) takes you to a visual demonstration of the form that was just completed.
- The **Upload** link enables you to submit the form.
- The **Help** (question mark) describes how this form works.
Concept Maps

This page enables you to send your map (new or revised) for review and feedback.

Inspiration 5.0 is used to create concept maps. This commercial software program is easy to use. Your map can be sent electronically via this web site and, when reviewed, can be downloaded and inserted into your file.

Once your concept map has been uploaded, it will be available in your portfolio. Once your concept map has been reviewed, you can download it and open it in Inspiration to see the reviewers comments.
Constructing Concept Maps

Inspiration 5.0 is a commercial software package to be used in developing concept maps. As you progress in constructing your map save it by naming it to a directory (A or C). Then, when you are ready to submit your concept map, upload it from your file directory and incorporate it into your web site account. Follow the instructions for submitting your concept map for review and feedback (See Concept Map).
An example of a concept map appears on this page. Notice that each link is labeled with a word or word phrase.

The information appearing in the bubbles are responses to the map from the reviewer. Once you receive a response you can revise your map to include this new information or suggested additions or deletions.
Your notebook conveys your thoughts, feelings, and questions. You can keep a record of your progress, share ideas, store information, or ask questions of others.

Enter your notes in the space provided and, when finished, click on Save. This will send your notes via the Internet for review and feedback by your teacher or researcher if warranted. Simultaneously, the notes you send will be saved in your portfolio.
The Portfolio is like a file cabinet that stores all the information that has been submitted including vee diagrams, concept maps, notebook entries, and other file formats.

For example, when you click Vee Diagram (button at the top left corner) you will see a drop-down list of all the vee’s your have submitted. Simply click the vee you would like to view and click the Select button. Then the status of the selected vee will show in the box below named Current Vee. You have the following options:

- Edit Vee allows you to edit your vee.
- Promote Vee to Group, permits others in your assigned group to edit or change the vee.
- The comments you wrote when submitting the vee will be displayed under Your Comments.
- Reviews indicate when your vee was reviewed.
- Share Your Vee permits you to share this vee with selected students.
Here you can save files containing video clips, audio clips, draft papers, graphs, charts, reference links to other sites, and any other information that is pertinent to your case report. The files can be in any format (gif, bmp, avi, doc, and so forth). Once a file is saved, you can upload it to your portfolio.

To upload your file follow the steps below:

1. Click on "browse" and find the file on your directory system. Click Ok or double click the highlighted file until it shows up in the window below, named "File".

2. If you have any comments or notes that you want to make for yourself about any of these files write them in the "Notes" section.

3. You have the option of replacing an older file in your file folder for the current selection. If you click the arrow next to "Replaces", and highlight one of the files in the drop-down list you are choosing to replace it with your current selection.

4. To save the file you have selected on your portfolio, you need to click the "Upload" button.

You simply browse your computer hard drive or A drive to find the file you want to upload and write any notes that pertain to your case report. Do this by clicking the Upload button.

A copy of the files you upload will appear in your portfolio under “Look and manage your file folder.”
Library

This is an important component of the Gateway section. On this page various items are displayed that will aid you in planning, carrying out, and finalizing your case report.

The page serves as a repository of cases, past student research reports, reference materials, pertinent links, and the Action Research Strategy that will be used in your research.
Personal Information

This page contains any information you wish to share with other students with whom you are working. Remember, any data you enter about yourself is public. Therefore, be sure to enter only information you are comfortable in disclosing.

Joseph Stover's Information

E-Mail: student@SCHOOL.com

Your Bio:
I am a student! I am an incurable student. I have a bad case of "acne" (see picture below).

Upload Your Image

File: Click on "browse" to select an image file of yourself for upload. Please keep it small (under 20kb).

Enter filename to upload: [input field]
Browse...
Upload Image

Current Image

[Image of a dollar sign]
Welcome Mary Teacher.

You last logged in on 9/15/09 4:08:51 PM

Welcome

This page gives you control of student records. You decide student passwords and distribute them. Students store information in their Working Portfolio. You decide whether the student(s) can share their concept maps, see diagrams, and any other information with other students in their class or with students at other affiliated schools working on a similar topic.

New/Modified Student Concept Maps

nana.txt 9/20/09 8:54:43 AM Joseph Stover

Explorer News

The Explorers of the Universe new website is launched!

The Explorers of the Universe program enters into the new year with a new look. This new web site gives you greater flexibility in planning, carrying out, and finalizing your case research. There are a variety of tools that will aid you in your research. You can store any type of information in your Portfolio. If another student is working with you in your school or at another affiliated school, and your teacher approves, you can share information from your Portfolio with them. Be sure to refer to the Action Research Strategy in the CD Case Guide before you begin your study. Use the concept maps, interactive new diagrams, and electronic notebook as you go.
**Explorer News**

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**Functions**

*Manage Students* - you to add a student and modify account information.

*Manage Groups* - allows you to add a group or modify the group's name and description. Note: groups are global, they do not just belong to you or your school, so when you modify it, it will be seen by teacher and students in Tennessee, Virginia, Alaska, etc.

*Manage Vees* - allows you to review your student's Vee diagrams, as well as view and edit any Vees submitted to your student's groups.

*Manage Concept Maps* - allows you to review any Concept map that belongs to one of your students or their groups.

*Manage notebook* - Allows you to review and comment on your student's notebooks.

*View Files* - Allows you to look at a student's file folder and the documents contained within.

*Update your information* - Update information about you, including a biography, email and pic.
Select Student: Joseph Slover

Add New Student
Delete Student Accounts

Student Information

First Name: Joseph
Middle Name: GA
Last Name: Slover

Group: MCLA

Username: Student
Password: Student

Note: To prevent a student from logging in to the system, you may change the password. Passwords should be unique and relevant to only one student.

Sharing Information

Can Share with other Students
Can Receive from Students

Vee Diagrams shared with others

[Time and date: 9/09/1994 2:23 PM]
Welcome Goli Sotoohi.

You last logged in on 9/9/09 4:15:33 PM

Welcome

This page allows you to review student works. On the sidebar are four buttons representing the four major categories of student work (Vea Diagrams, Concept Maps, Notebooks, and Other Files). In addition, you may browse the Explorer's Library or update your biographical information or picture (The Library button and My Info button respectively).

If you want to use any of the student tools, switch to "Student" mode by clicking on the silver Student button in the sidebar. This will switch you to a student account was created for you. Any time that you want to switch back to Researcher mode, just click on the Researcher button.

EXPLORER NEWS

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### Scoring Model*

<table>
<thead>
<tr>
<th>Categories</th>
<th>Total</th>
<th>Not Valid</th>
<th>Total Valid Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationships Each level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = not labeled</td>
<td>3</td>
<td>3 x 3 = -3</td>
<td>20</td>
</tr>
<tr>
<td>3 = labeled</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hierarchy 5 Points Each Level</td>
<td>20</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Branching</td>
<td>47</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Level 1 = 5 Points</td>
<td>5 x 3 = 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2 = 4 Points</td>
<td>4 x 3 = 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3 = 3 Points</td>
<td>3 x 3 = 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 4 = 2 Points</td>
<td>2 x 3 = 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 5 &amp; beyond = 1 Point</td>
<td>1 x 3 = -3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross Links 10 Points Each</td>
<td>10 x 3 = -9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples 1 Points Each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 x 4 = 4</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Non-Example</td>
<td>4</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Grand Total</td>
<td>98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:

In the column labeled "Total" calculate the total number for each category using the formulas.

In the column labeled "Not Valid" determine how many invalid or misconceptions exist and using the formulas on the left column calculate how much needs to be deducted in each category (use minus sign).

In the last column labeled "Total Valid Score" simply subtract the total score from the "not valid" for each category to calculate the grand total.
Explorers of the Universe

Dr. Michael Busby

Classroom Application
EXPLORERS OF THE UNIVERSE

PHY211
COLLEGE PHYSICS I

Non-Calculus Based Physics Class
(Biology, Chemistry, Allied Health Professions)
Fall Semester 1999 - 38 Students
College Physics I
Course Requirements Concept Map

PHY 211
Course Requirements

Lectures 20% of Grade

Homework 60% of Grade

Tests 10% of Grade

Electronic Notebook 10% of Grade

Concept Maps
Rashanda Robertson's Notebook

Your Entry

Dr. Busby: The first exam wasn't so bad. I was a little confused on the second question, but I know where I went wrong. Unfortunately, I still don't know the mistakes that I made with the problem. I hope that if you have time, maybe you could review this with the class or just me if no one else has questions. I am still working on understanding the questions in the problem sets. They seem to be extremely harder than the examples from class and the test questions. Well, I will continue to try to do my best. Thanks.

Teacher Comments

Michael Busby said on 9/22/99 6:53:28 AM . . .
Rashanda, I think you did very well on the first exam. You made an 83. I will go over all the test problems in class on Thurs. You are correct, the homework problems are generally a little more difficult than the class examples; that's why I hold the extra night sessions. Thanks for the email.