Data Detectives Student Handbook

by

Kay McLennan, Ph.D.
mclennan.kay@gmail.com
© 2012 Kay McLennan

TABLE OF CONTENTS

PART ONE | INTRODUCTION

> *"It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts."*
>
> *-- Sherlock Holmes in "A Scandal in Bohemia" by Arthur Conan Doyle*

The best-selling book entitled *How to Lie With Statistics* (by Darrell Huff) was first published in 1954. Accordingly, an understanding of how statistics and graphs can be misleading and misused has been in the public consciousness for more than a half a century. Yet, in the same way observations, data, and the visual display of data can be misleading, observations, data, and the visual display of data tell us a lot about our experiences and the world around us. In particular, when we analyze our observations we make comparisons and generalizations and where possible, theorize about cause and effect.

In the same way 2-dimensional data and graphs can be misleading and misused, 3-dimensional data and graphs can be misleading and misused. Still, a 3-dimensional learning environment (read: 3D virtual world) can provide a uniquely effective and interactive platform for learning about the critical thinking skills that enable reasoning about the world around us.

PART TWO | GETTING STARTED

> *"The game is afoot."*
>
> *-- Sherlock Holmes in "The Adventure of the Abbey Grange" by Arthur Conan Doyle*

SECTION 2.1 | ICE BREAKER WAITING AREA

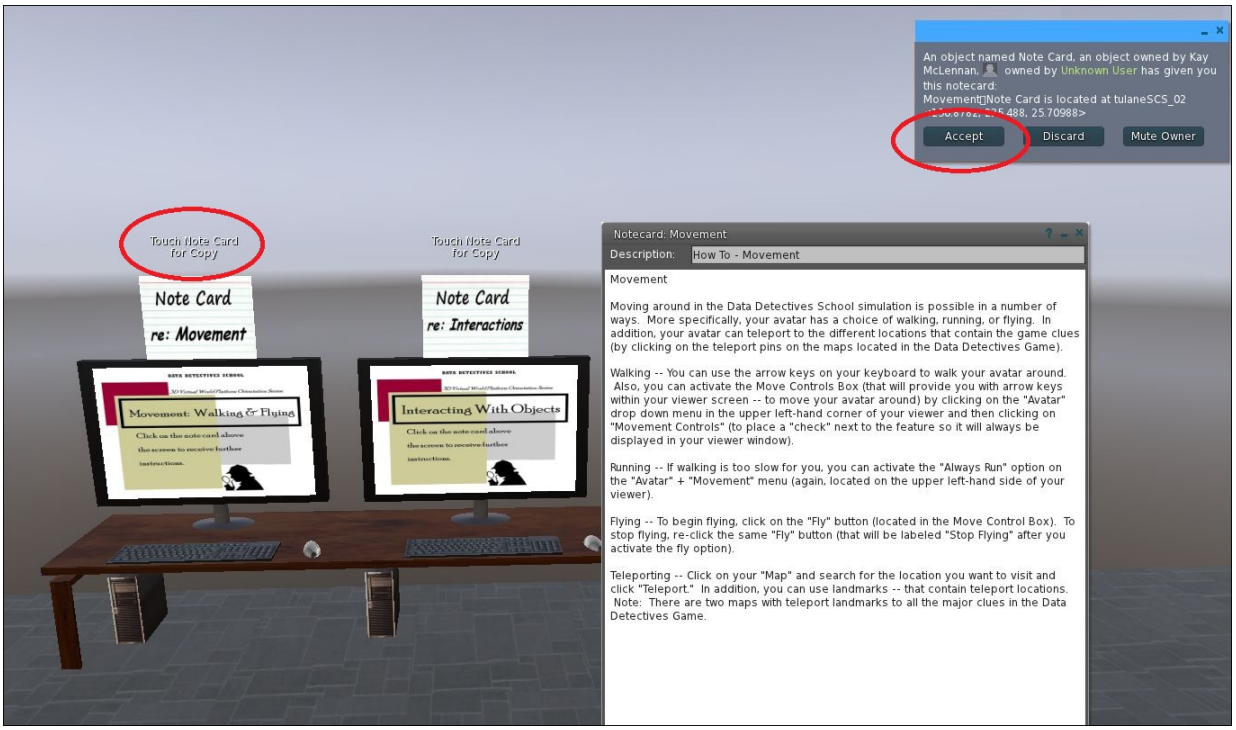
When you enter the Data Detectives School, touch the stack of books on a stand to learn about the ice breaker activities located in the lobby waiting area. More specifically, you (along with other students in your class) can click on the "web site" buttons associated with different popular fictional detective personas or learn about different lessons from Sherlock Holmes, including "Why Most of Us Wouldn't Be Able to Tell That Watson Fought in Afghanistan" by Maria Konnikova (with more in the series of "Lessons from Sherlock Holmes" by Maria Konnikova displayed throughout the Data Detectives School).

In addition, voting for a favorite detective (see below), provides a non high stakes opportunity for you and your classmates to practice using an interactive feature in the 3D virtual world simulation.

Finally, there is a waiting area (see below) for students to assemble -- if multiple students or an entire class will be using the tutorials and playing the Data Detectives Game at the same time.

SECTION 2.2 | INTEGRATED NEW USER ORIENTATION AREA

If you are a new virtual world user (or would like to refresh your virtual world skill set), you will find a new user tutorial area adjacent to the Lobby Meeting Area in the Data Detectives School.



More specifically, the new user tutorial area includes note cards with "how to" steps and tips (with the note cards accessed by simply touching the items and then accepting the note card delivery -- see the circled items in the picture above). Note: Copies of the note card "how to" note cards are located in Appendix One of this manual.

Also (or as an alternative to using the note card textual materials), you can watch a short machinima video clip that explains how to (1) set-up a viewer, (2) move around in the virtual space, (3) communicate with others, and (4) change the appearance of their avatar. The video clip is accessed by touching the movie screen in the new user tutorial space -- see the picture below.

SECTION 2.3 | CRITICAL THINKING LEARNING OUTCOMES

Reasoning about our environment and experience is critical in economics and other disciplines. In particular, reasoning about the world enables evaluations of what is and what is not accurate.

In this Data Detectives simulation, each participant-player will find tutorials about the topics below.

- ***Statistics*** - An examination of how statistics can be used and misused when making claims.
- ***Graphs*** - An examination of how graphs and charts can be misleading.
- ***Comparisons*** - An examination of how to reason using comparisons (known as analogies). Where analogies are incomplete arguments, careful analysis can clarify the accuracy of claims.

- ***Generalizations*** - An examination of how to generalize from experience – to understand what is true about a group based on an understanding of part of the group.
- ***Cause and effect*** - An examination of how to determine cause and effect – leading to an understanding of the methods used to determine causes based on statistical evidence.

To continue, follow the arrows in the floor to the next "Skill Level Pre Test" center -- to test your initial understanding about the five critical thinking skills listed above.

SECTION 2.4 | PRETEST

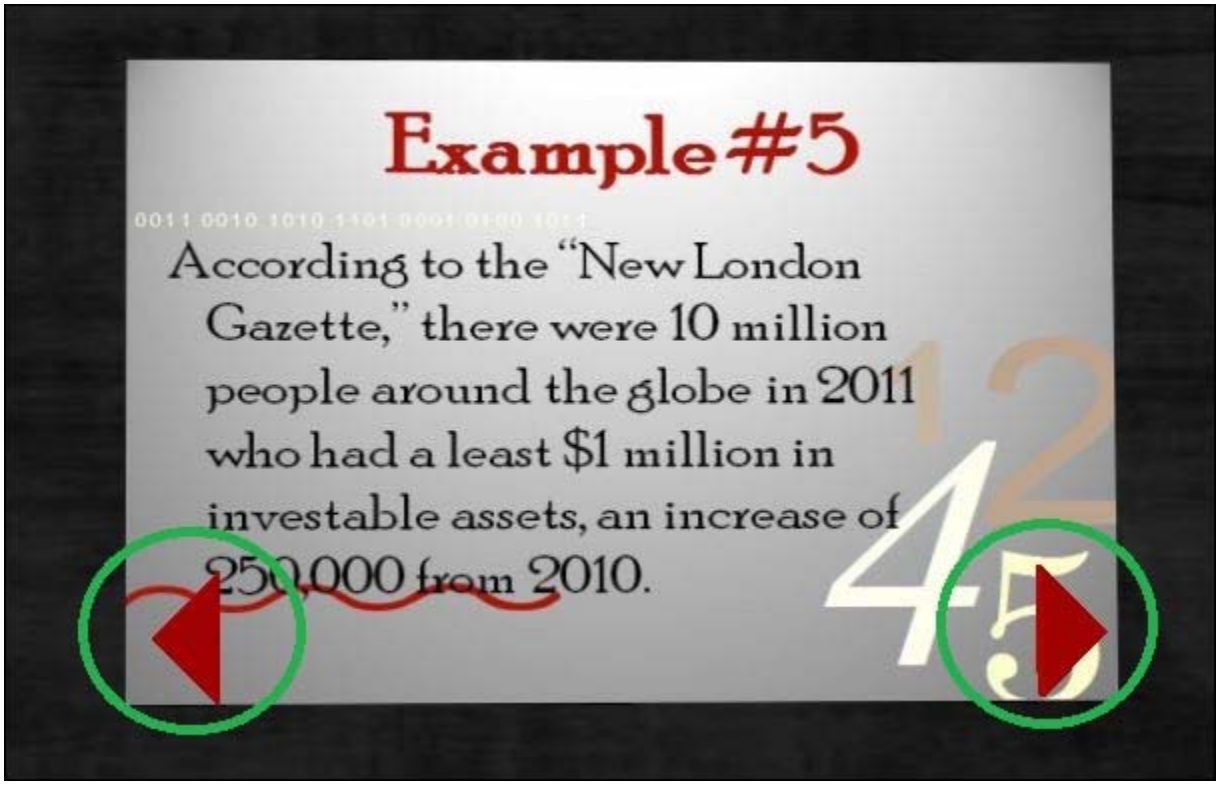
The demonstration pretest center is set-up with a two question self-test assessment (that includes the answers to the self-test assessment). More specifically, touch one of the computer screens on the left-hand side of the "Pretest" sign and you will receive the pretest questions in a note card. After you answer the questions on the note card, you can check your answers by touching the mouse next to the computer screen (and another note card will be delivered).

PART THREE | CRITICAL THINKING SKILLS TUTORIALS

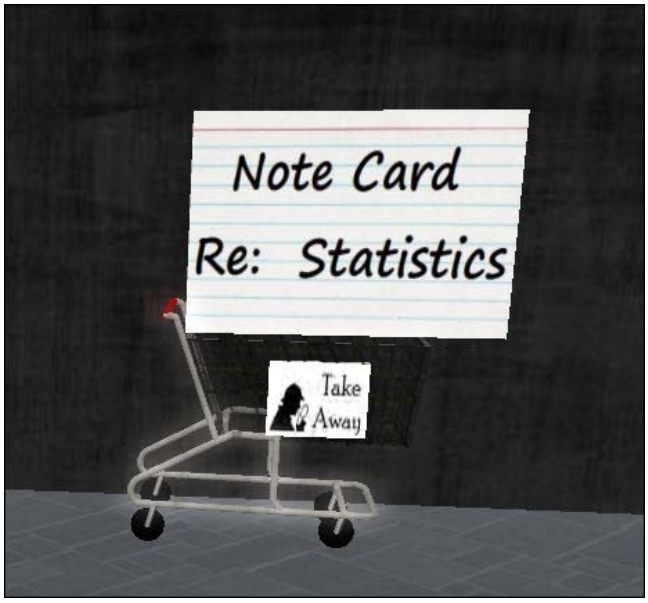
> *"They say that genius is an infinite capacity for taking pain," he remarked with a smile. "It's a very bad definition, but it does apply to detective work."*
>
> *-- Sherlock Holmes in a "A Study in Scarlet" by Arthur Conan Doyle*

SECTION 3.1 | USING THE TUTORIAL CENTERS

To get started reviewing the tutorial materials, use the red triangle forward and back buttons to scroll through the different example slide shows that are located at each tutorial center (see the picture below with the forward and back buttons circled in green). In addition, each tutorial station includes needed definitions and summary information on how to evaluate information in that critical thinking skill category.



[Again, there are five critical thinking skill categories explored -- statistics, graphs, comparisons, generalizations, and cause and effect.] Further, each tutorial center has a "take-away" note card with the essential definition information and summary conclusions (see the picture of the shopping cart with a take-away note card below).



Finally, follow the guided path arrows -- see picture below -- to the next tutorial station (and eventually, to the Data Detectives Game).

SECTION 3.2 |A CLOSER LOOK AT STATISTICS

The "A closer look at **Statistics**" take-away note card includes the following.

Definition: Mean - The average or mean of a collection of numbers is obtained by adding the numbers together and then dividing by the number of items.

Definition: Median - The median is the midway mark, with the same number of items above the median mark as there is below the median mark.

Definition: Mode - The mode is the number most often included in the set or most often attained (in the case of test scores).

[Conclusions to keep in mind...] An average is a useful figure to know only if:

- There is not too much variation in the figures or scores or numbers;
- The average is close to the median amount; and
- The distribution is more or less bell- shaped.

STUDENT TIP | NO NEED TO FEAR THE MATH

Before looking at the materials included in the STATISTICS tutorial, please keep in mind you will NOT be called upon to make complex statistical calculations. Rather, the most complex statistical calculation you may need to perform includes adding four (or less or more) numbers and then dividing the sum by four (or less or more) to find the average of the four numbers.

As a numerical example of the above:

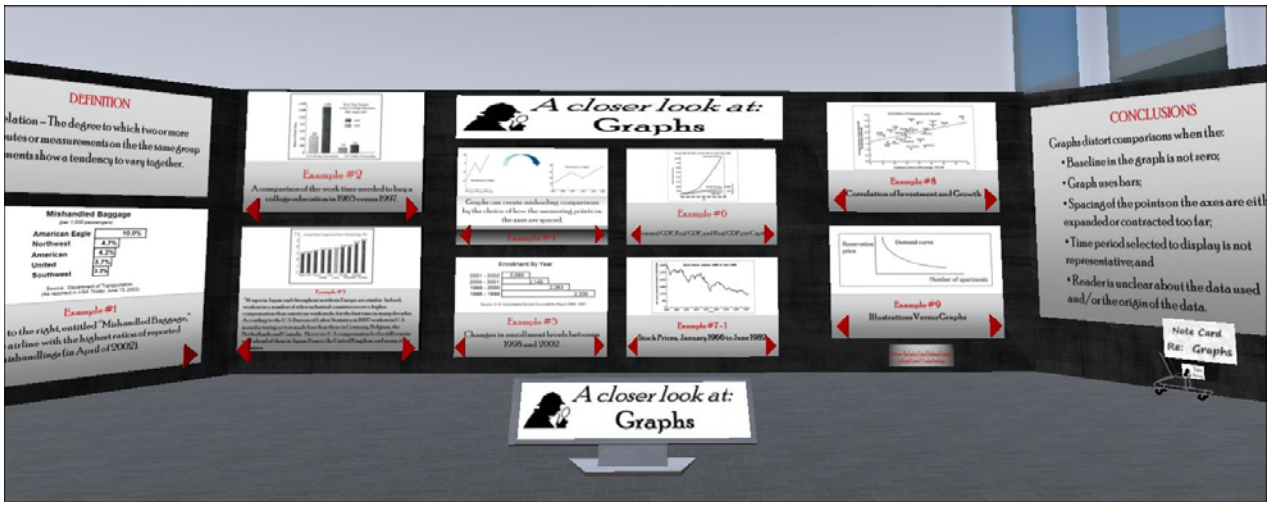
45 + 73 + 80 + 14 = 212 / 4 = 53

Also, as a brief review of percentage(s), a percent is another way of expressing parts of a whole. Further, 100% equals one whole and when we convert percentages to decimal numbers, 100% becomes 1.00 (and 40% becomes 0.40). To calculate percentages, see the example below.

40 Students like multiple choice tests; 77 Students do not like multiple choice tests; and 30 Students are undecided (re: multiple choice tests) -- what is the percent of students that do not like multiple choice tests?

Add 40 + 77 +30 = 147 and divide 77 by 147 = 0.52 or 52%

SECTION 3.3 | A CLOSER LOOK AT GRAPHS



The "A closer look at **Graphs**" take-away note card includes the following.

Definition: Correlation – The degree to which two or more attributes or measurements on the the same group of elements show a tendency to vary together.

[Conclusions to keep in mind...] Graphs distort comparisons when the:

- Baseline in the graph is not zero;
- Graph uses bars;
- Spacing of the points on the axes are either expanded or contracted too far;
- Time period selected to display is not representative; and
- Reader is unclear about the data used and/or the origin of the data.

STUDENT TIP | NO NEED TO FEAR GRAPHS

In the same way some students have an aversion to math, some students have an aversion to graphs. In turn, please keep in mind the following details about graph use.

- Graphs are a visual representation of data displayed (or "plotted") on the space within two axes.
- The horizontal axis in a graph is known as the x-axis and the vertical axis is known as the y-axis.
- A point on the graph is denoted by an ordered pair of coordinates, with the first number in the pair referring to the horizontal position on the x-axis and the second number in the pair referring to the vertical position on the y-axis.
- The x-axis and y-axis intersect at the origin or at the point (0,0).

SECTION 3.4 | A CLOSER LOOK AT COMPARISONS

The "A closer look at **Comparisons**" take-away note card includes the following.

Definition: **Analogies** – A comparison becomes reasoning by analogy when it is part of an argument. On one side of the comparison we draw a conclusion, so on the other side we say the conclusion should be the same.

Definition: **Fallacy of composition** – It is a mistake to argue what is true of the individual is therefore true of the group, or what is true of the group is therefore true of the individual.

[Conclusions to keep in mind...] To Evaluate Analogies:

- Is this an argument? What is the conclusion?
- What is the comparison?
- What are the premises (the sides of the comparison)?
- What are the similarities?
- Can we state the similarities as premises and find a general principle that covers the two sides?
- Does the general principle really apply to both sides? What about the differences?
- Is the argument strong or valid? Is it good?

SECTION 3.5 | A CLOSER LOOK AT GENERALIZATIONS

The "A closer look at **Generalizations**" take-away note card includes the following.

Definition: **Generalizing** – To ***generalize*** is to conclude a claim about a group, the ***population***, from a claim about some part of it, the ***sample***. To generalize is to make an argument. Sometimes the general claim that is the conclusion is called the ***generalization***; sometimes we call the whole argument a generalization. The claims about the sample are called the ***inductive evidence*** for the generalization.

Definition: **Representative sample** – A sample is representative if no one subgroup of the whole population is represented more than its proportion in the population. A sample is ***biased*** if it is not representative.

Definition: Random sampling – A sample is chosen ***randomly*** if at every choice there is an equal chance for any of the remaining members of the population to be picked.

Definition: **Sample size** – For a generalization to be good, the sample has to be big enough. Generalizing from a sample that is obviously too small is called a ***hasty generalization*** based on ***anecdotal evidence***.

Definition: **Well studied sample** – For a generalization to be good, the sample has to ***studied well*** **.** If a generalization is based on questionnaire or survey data, the questions have to be constructed without bias. In addition, questions need to constructed to check for internal consistencies (read: measures of truthfulness).

Definition: **The gambler's fallacy** – The gambler's fallacy is to reason that a run of events of a certain kind makes a run of contrary events more likely in order to even up the probabilities.

[Conclusions to keep in mind...] **Premises needed for a good generalization:**

- The sample size is representative;
- The sample is big enough; and
- The sample is studied well.

SECTION 3.6 | A CLOSER LOOK AT CAUSE AND EFFECT

The "A closer look at **Cause & Effect**" take-away note card includes the following.

Definition: ***Causal claims*** – A causal claim is a claim that can be rewritten as "X causes (caused) Y." A ***particular*** causal claim is one in which a single claim can describe the (purported) cause and single claim can describe the purported effect. A ***general*** causal claim is a causal claim that generalizes many particular causal claims.

Definition: ***Normal conditions*** – The obvious and plausible unstated claims that are needed to establish that the relation between purported cause and purported effect is valid or strong are called the normal conditions for the causal claim.

Definition: ***Post hoc ergo propter hoc*** – ("after this, therefore because of this") is the fallacy of claiming that there is cause and effect just because one claim became true after another.

[Conclusions to keep in mind...] **Necessary conditions for cause and effect:**

- The cause and effect happened (are true).
- It is (nearly) impossible for the cause to happen (be true) and the effect not to happen (be false), given the normal conditions.
- The Cause precedes the effect.
- The cause makes a difference – if the cause had not happened, the effect would not have happened, given the normal conditions.
- There is no common cause.

Common mistakes in reasoning about cause and effect:

- Tracing the cause too far back – when we trace a cause too far back, the problem is that the normal conditions begin to multiply.
- Confusing cause with effect – if reversing cause and effect sounds just as plausible as the original claim, a further investigation of the evidence is needed.
- Looking too hard for a cause – when sometimes it is sometimes just a coincidence.

PART FOUR | THE DATA DETECTIVES GAME

> *"Data! Data! Data!" he cried impatiently. "I can't make bricks without clay."*
>
> *-- Sherlock Holmes in "The Adventure of the Copper Beeches" by Arthur Conan Doyle*

SECTION 4.1 | GAME NARRATIVE

You have been hired by the Cloud Buds™ Music Company as the director of business development. Cloud Buds™ sells an innovative cloud-based MP3 player. More specifically, Cloud Buds™ are lightweight ear buds that use sophisticated satellite based transmitters and Internet technology to deliver the customer's preprogrammed playlists of music. In addition, Cloud Buds™ sell for $69 a pair (plus an optional $10 a year insurance policy to automatically replace one or more lost ear buds) -- substantially less than the most established competitor, High Notes MP3 players (that sell for $99 per player).

As the director of new business, your first assignment is to accompany BILL-I-AM (of the Sweet Peas Band) to New London where he will perform with the New London artist Paprika Spice (of the Spicy Girl Band). Cloud Buds™ is sponsoring BILL-I-AM's and Paprika Spice's joint performances -- in the hope of laying the foundation for introducing the Cloud Buds™ product to New London consumers (and especially the consumers in the demographic of 13-24 year-olds). In the same way celebrity endorsements are one of the mainstays of the U.S. marketing campaign for Cloud Buds™, your boss expects New Londoners will be influenced by the celebrity endorsement from BILL-I-AM and Paprika Spice.

More specifically, while in New London, your boss wants you to find out what you can about New London, including:

-- Economic factors (read: current conditions and outlook);

-- How easy it is to do business in the city;

-- What is the state of the available technology infrastructure (including how robust are the local data centers, transmission control systems, and system security measures);

-- Demographics (including the age distribution of the city residents);

-- Political and cultural factors;

-- Other competitors in the market; and

-- Any other factors of relevance.

Also, your boss has been told retail space rents for about $45 a square foot per month (on average) and the company would require at least a 1,500 square foot shop to open a new Cloud Buds™ store. Also, based on a square foot rental of $45 (times the 1,500 square foot size of the shop times 12 months a year), the highest hourly salaries Cloud

Buds™ could afford for the two clerks needed to run the shop will be $10 an hour for the store manager and $8 an hour for the assistant manager (with each salary times 40 hours a week and 52 weeks a year).

As further background, your boss provided you with some comparison information from the market for MP3 players in the United States. In turn, your boss suggests comparing what you learn about New London to what you know about the U.S. market -- to make an assessment of whether New London would be good market for Cloud Buds™.

Percent of the Population That Owns a MP3 Music Player, In Each Age Category, in the U.S. Market

Aged 13 to 17 years old.....30%
Aged 18 to 24 years old.....27%
Aged 25 to 34 years old.....25%
Aged 35 to 49 years old.....12%
Aged 50 to 54 years old..... 8%
Aged 55 to 64 years old..... 3%
Aged 65 years and older..... 2%

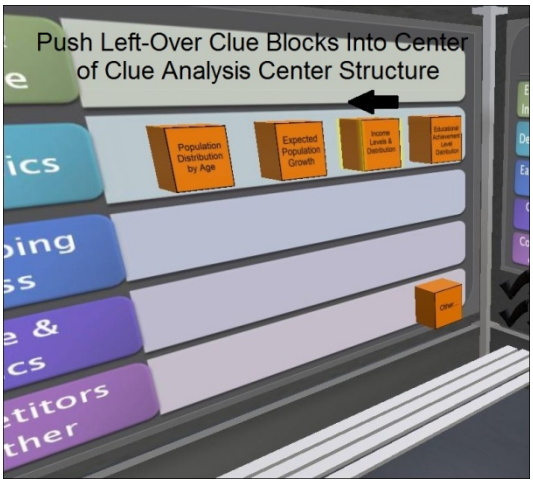
Distribution of MP3 Music Player Owners, by Income, in the U.S. Market

Up to $25,000.....8%
$25,001 to $50,000..... 18%
$50,001 to $75,000.....19%
$75,001 to $100,000..... 17%
$100,001 and up.....38%

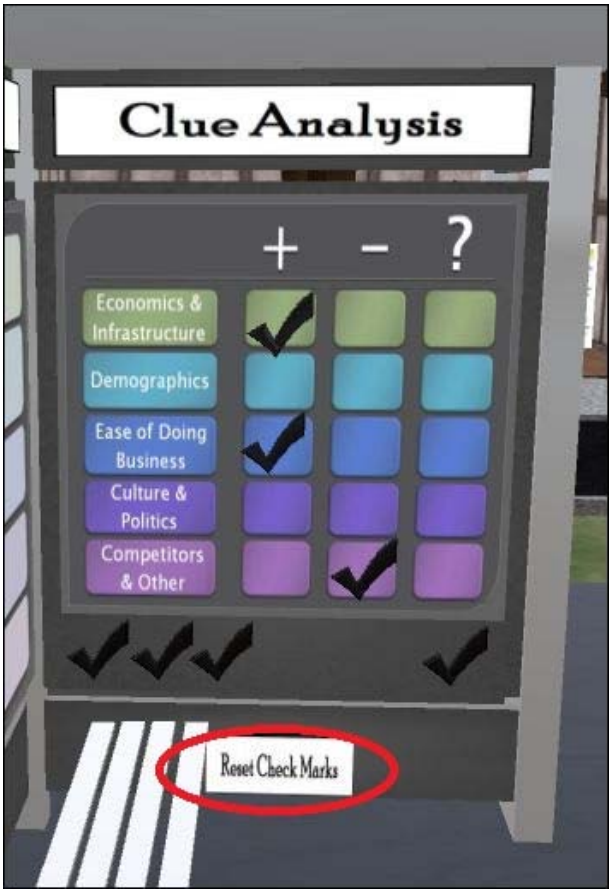
Note: The U. S. market for MP3s is known to be about 20 percent higher (re: ownership levels) than the New London market (but the New London market is forecast to match the U.S. market in one year).

SECTION 4.2 |GAME PLAY COMPONENTS

Important Notes: (1) If you are playing alone or without an instructor, make sure the clue analysis centers (#1 through #4) are free of clue blocks (with the exception of the "Other" clue block that is locked in place. More specifically, when you see left-over clue blocks on a clue rezzing panel in the clue analysis centers, just push the clues into the center of the clue analysis center structure (see picture below).



(2) Make sure the check marks on the clue analysis panels (in the clue analysis center structure) are sett to the starting positions (at the bottom of the panel). If the check marks need to be reset, click on the "Reset Check Marks" button and click on "Build" (see picture below).

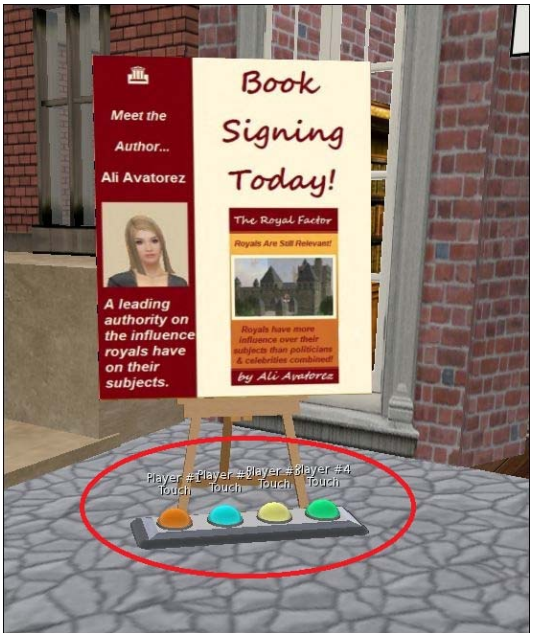


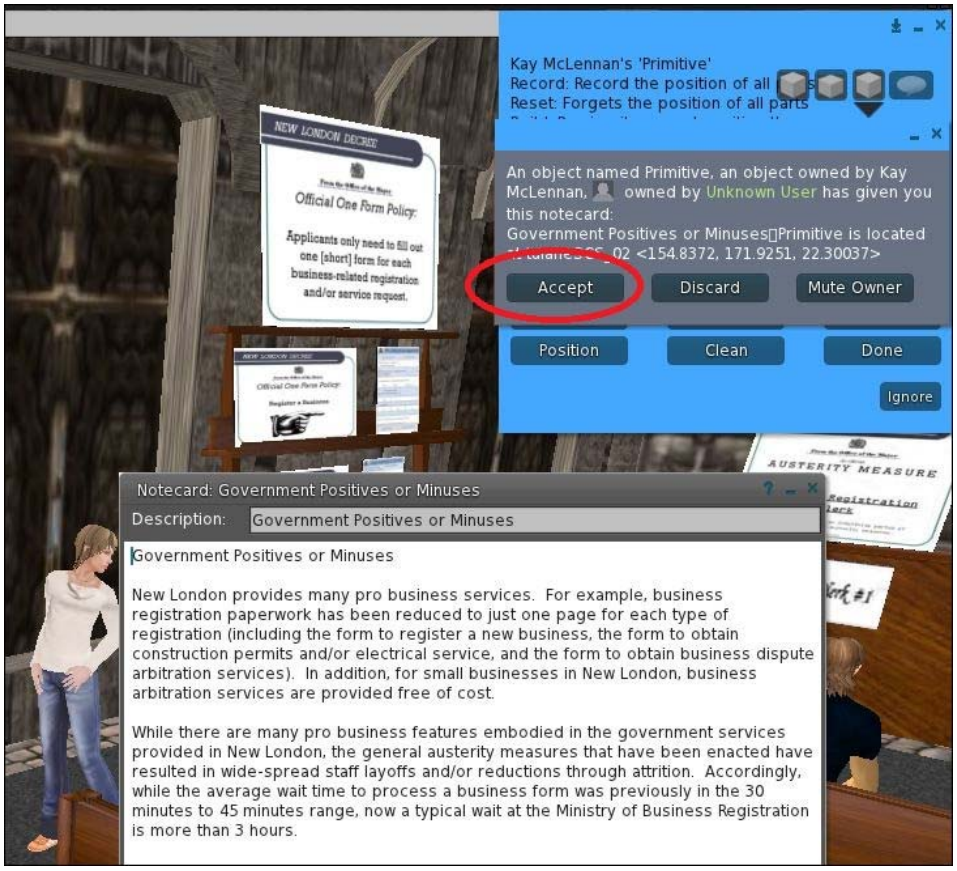
The available game play components include the following:

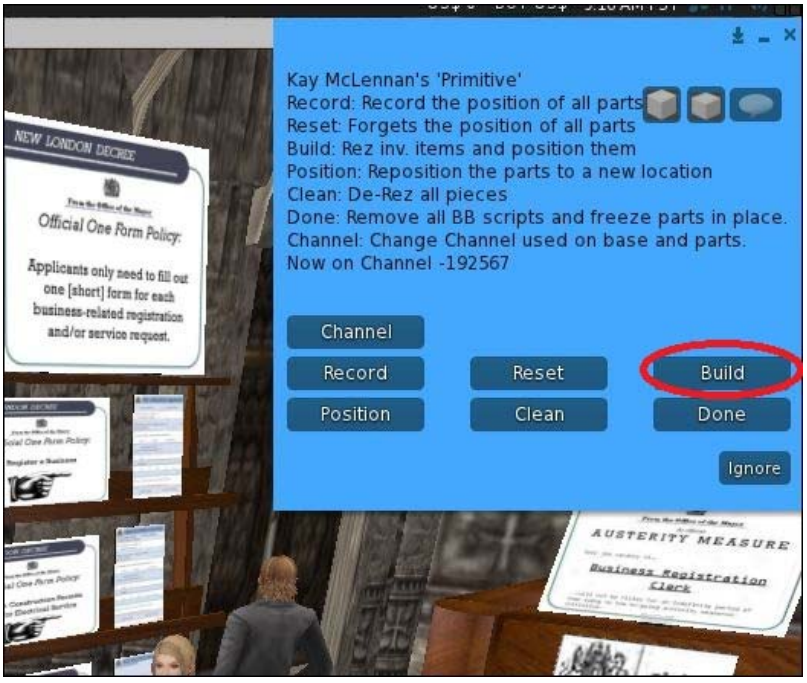
- Written instructions in a note card that is dispensed when a player touches the stack of books on a stand (see the picture below).

- A map with landmark teleports to the major clues [see the picture below with the landmark giver push pins circled in red, the telephone booth instructor message center circled in blue, and the exit landmark giver (to the wrap-up discussion area) circled in green].

- Clue rezzers (with accompanying explanatory note cards) -- see the picture of the rezzer buttons below. Note: Each player will be Player #1 or Player #2 or Player #3 or Player #4 during the duration of the game. Further, each player will press their button on each clue rezzer found, accept the note card that will be delivered, and then will press "Build" on the control box that will appear in the upper right-hand side of their viewer.

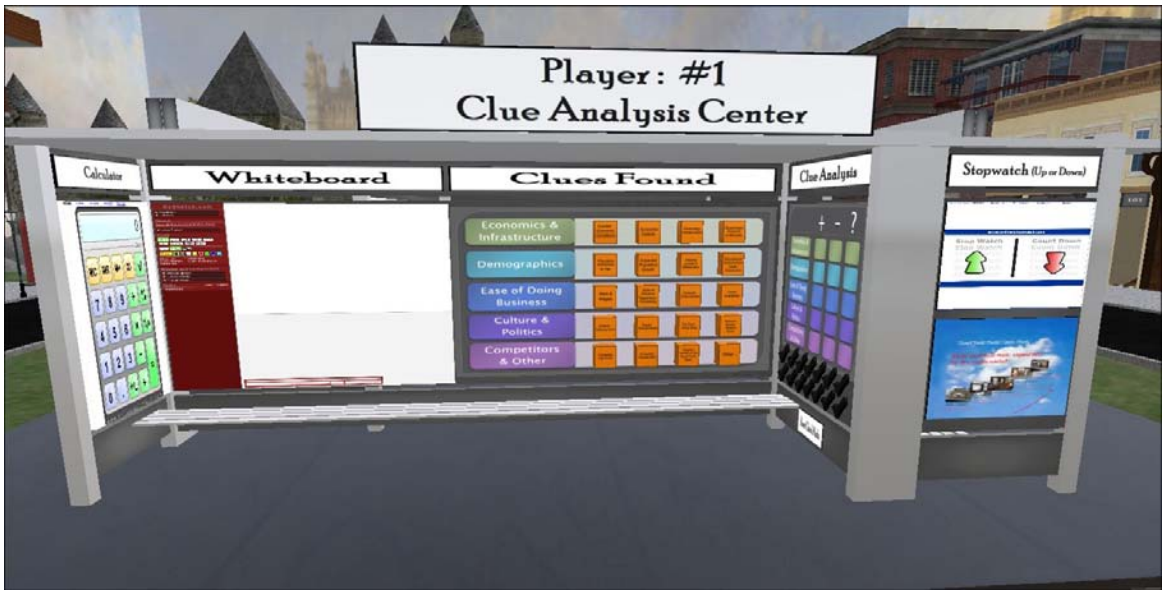


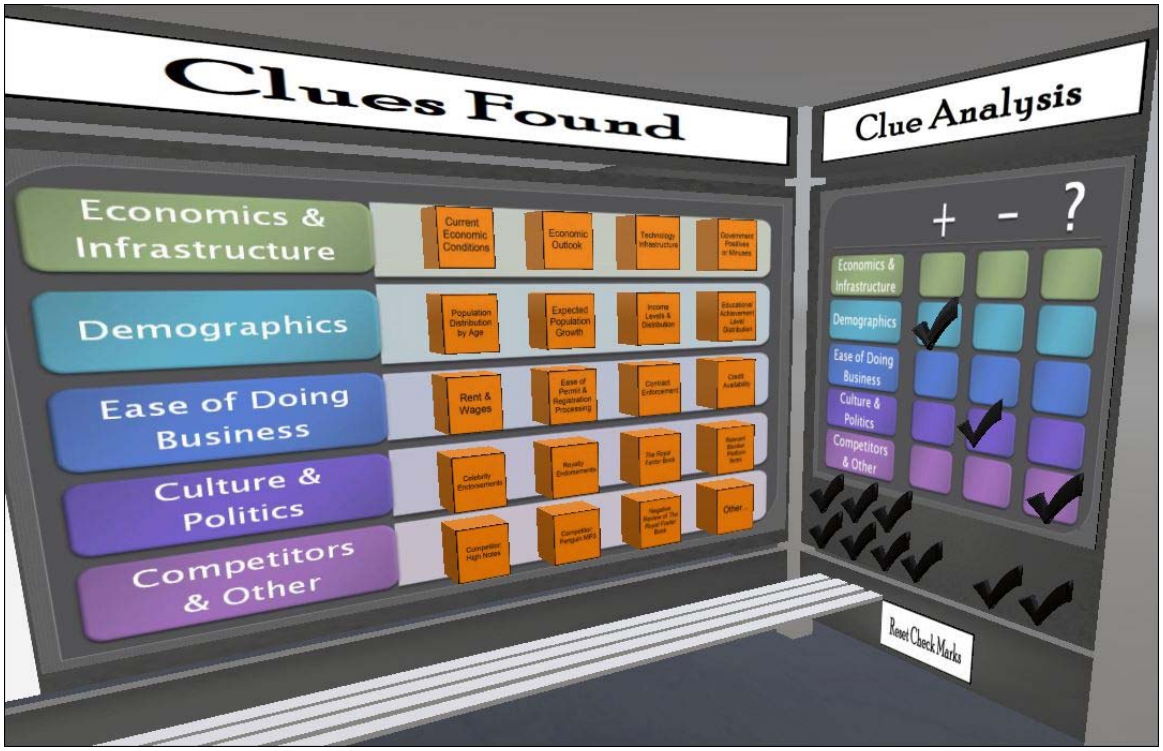




More specifically, after pressing a clue rezz button, students need to accept clue note card delivered and second, click on the "Build" button (see the pictures above).

- A clue analysis center (with four analysis stations) -- see the pictures below. Note: Each clue analysis center includes a media-on-a-prim (MOAP) stopwatch, a MOAP calculator, a MOAP whiteboard, a found clues board (where each clue will be rezzed after the player presses the accompanying button on the clue rezzer device), and a clue analysis board with moveable checkmarks to keep track of player conclusions. After a player presses "Build" on a clue rezzer device, the accompanying clue(s) will appear on the "Clues Found" panel on their assigned Clue Analysis Center.





- [Possible] Additional clues built into the simulation details (including signage -- see the picture below).

- [Possible] Additional clues in the early and late editions of the New London Gazette (see the newspaper dispenser below).

- A telephone booth communications center that lets students know if the instructor is online and if the instructor is not online, includes an answering machine that records student messages.

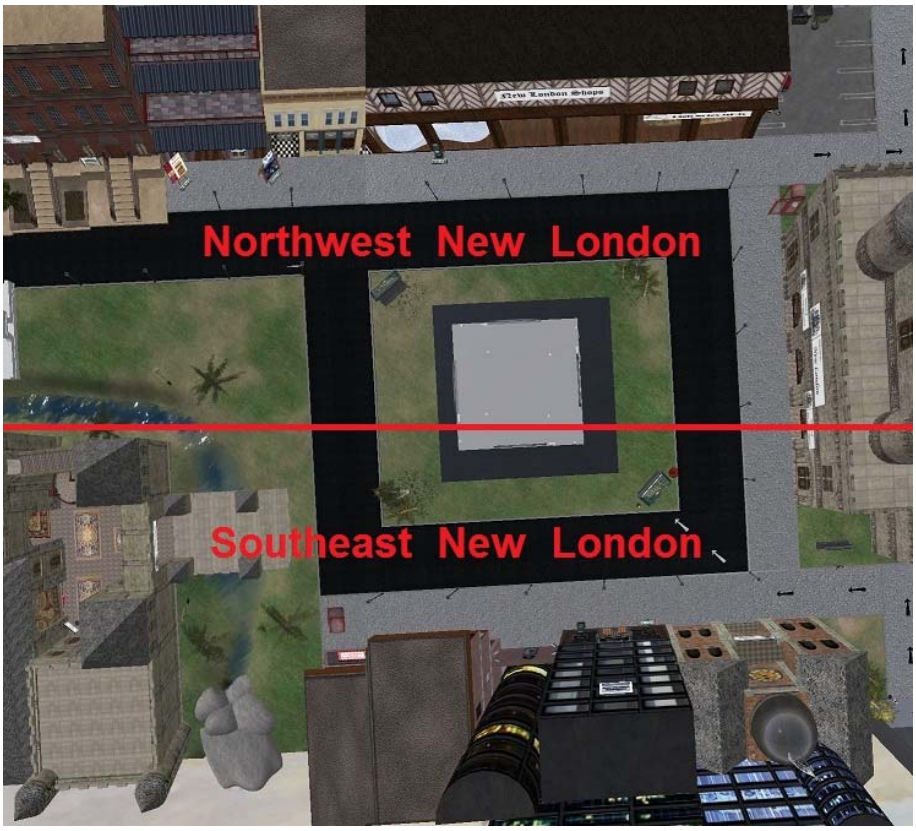
SECTION 4.3 | SOLITAIRE PLAY

In the solitaire version of the Data Detective Game, students will be required to keep a written record of how they arrived at the conclusions they made as they evaluated the relevance and veracity of the available clues. In turn, your instructor will provide detailed feedback (re: the game summary provided by a student as well as feedback on any clues a solitary player may have missed).

SECTION 4.4 | TWO TO FOUR PLAYERS

The Data Detective Game is ideally suited for two to four players. More specifically, with four different clue analysis centers, when two to four players are simultaneously searching for clues, each player will have their own clue analysis center (that will be assigned by their instructor).

Note: With multiple players (and team play), depending on the skill level of the players and well as the volume of players, it may be necessary for your instructor to direct half of the players to the clues located in the Northwest portion of New London and half of the players to the clues located in the Southeast portion of New London (see the picture below).



SECTION 4.5 | TEAM PLAY

Team play is a way to accommodate more students at one time. However, four teams of four players each is likely to be the maximum number of avatars that can be accommodated on a standard Open Simulator island simulation. Also (and as illustrated in the picture above), the best approach for managing larger groups within the simulation includes dividing the group in half and assigning half to the Northwest side of New London and the other half to the Southeast side of New London.

SECTION 4.6 | ENDING PLAY

The likely scenario for most simulation exercises include a predetermined length of play based on class length. In turn, using the example of a 60 minute class (and assuming the students in the class previously studied the tutorial materials in the Data Detectives School), the instructor will likely divide the available time between (1) clue finding and analysis, and (2) the wrap-up discussion. Further, a recommended division of time includes allocating 40 minutes to clue finding and analysis and 20 minutes to the wrap-up discussion.

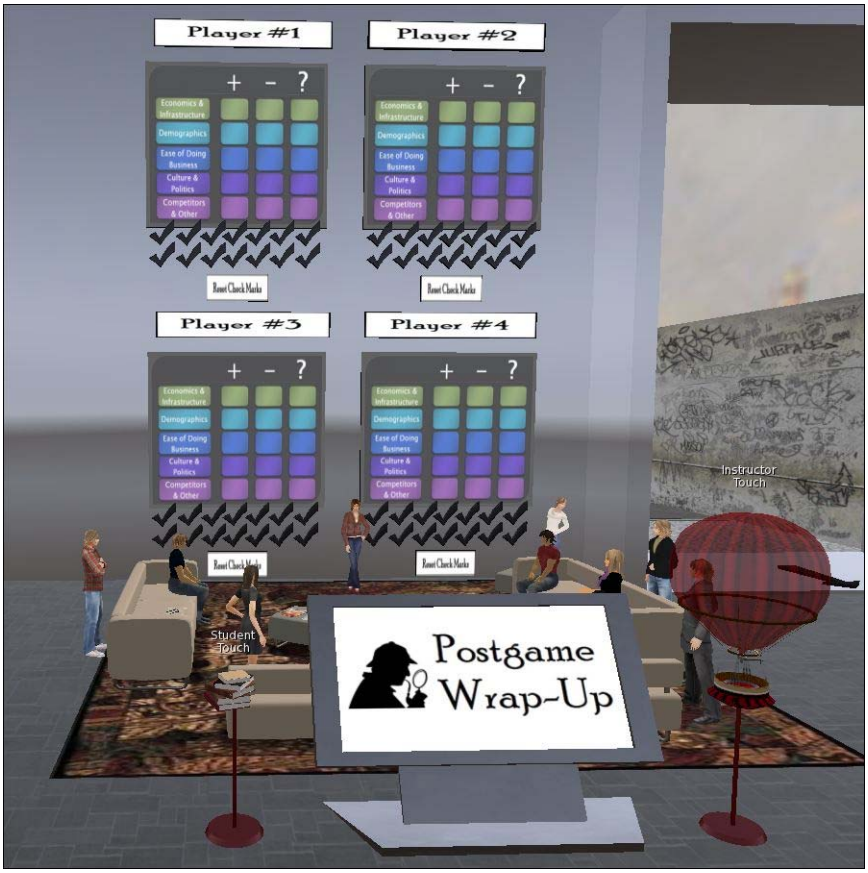
PART FIVE | POST GAME WRAP-UP

> *"Having gathered these facts, Watson, I smoked several pipes over them, trying to separate those which were crucial from others which were merely incidental."*
>
> *-- Sherlock Holmes in "The Crooked Man" by Arthur Conan Doyle*

SECTION 5.1 |FORMATS FOR SOLITAIRE PLAY & GROUP PLAY WRAP-UPS

When the Data Detectives Game is played with multiple players, the wrap-up station* -- that includes multiple clue analysis boards (for facilitating side-by-side comparisons of the players' different/similar conclusions) -- will be used for the wrap-up discussion (see the picture of the postgame wrap-up station below).

When the Data Detectives Game is played alone, student players will submit written discussions of their conclusions (in exchange for written feedback from the instructor).



* The wrap-up station is located in the hallway adjacent to the exit that is to the left of the Ministry of Business Registration building.

SECTION 5.2 | POSTGAME TEST

Like the pretest center, the postgame assessment center is set-up with a self-test assessment (that includes the answers to the self-test assessment).

SECTION 5.4 | LESSONS FROM SHERLOCK HOLMES

The "Lessons from Sherlock Holmes" posters (displayed throughout the Data Detectives School as well as displayed as a collection in the wrap-up hall -- see the picture below), include link buttons to the online blog articles (by Maria Konnikova) that appeared in *Scientific American* magazine in 2011. The purpose of including the lessons is to provide more examples of critical thinking and in this case, critical thinking by the colorful and entertaining fictional persona, Sherlock Holmes. Sample titles from the series are listed below.

- *Lessons from Sherlock Holmes: Don't Just See, Observe: What Sherlock Holmes Can Teach Us About Mindful Decisions* by Maria Konnikova (August 19, 2011).
- *Lessons from Sherlock Holmes: Paying Attention to What Isn't There* by Maria Konnikova (August 23, 2011).
- *Lessons from Sherlock Holmes: Cultivate What You Know to Optimize How You Decide* by Maria Konnikova (August 26, 2011).
- *Lessons from Sherlock Holmes: Perspective is Everything, Details Alone Are Nothing* by Maria Konnikova (August 30, 2011).
- *Lessons from Sherlock Holmes: Don't Underestimate the Importance of Imagination* by Maria Konnikova (September 2, 2011).
- *Lessons from Sherlock Holmes: The Situation Is in the Mindset of the Observer* by Maria Konnikova (September 9, 2011).
- *Lessons from Sherlock Holmes: the Power of Public Opinion* by Maria Konnikova (September 13, 2011).
- *Lessons from Sherlock Holmes: Don't Tangle Two Lines of Thought* by Maria Konnikova (September 16, 2011).
- *Lessons from Sherlock Holmes: Breadth of Knowledge is Essential* by Maria Konnikova (September 20, 2011).

- *Lessons from Sherlock Holmes: Trust in The Facts, Not Your Version of Them* by Maria Konnikova (September 20, 2011).
- *Lessons from Sherlock Holmes: From Perspective-Taking to Empathy* by Maria Konnikova (October 25, 2011).
- *Lessons from Sherlock Holmes: Why Most of Us Wouldn't Be Able to Tell That Watson Fought in Afghanistan* by Maria Konnikova (November 1, 2011).

SECTION 5.5 | GIFT SHOP

The Gift Shop in the Data Detectives School includes a few items student participants can purchase for $0. More specifically, t-shirts, diplomas, detective badges, mugs, and teddy bears are available for purchase (for $0).

APPENDIX ONE | NEW USER GUIDE

New User Tutorial Area Adjacent to the Lobby Meeting Area in the Data Detectives School

HOW TO | MOVE AROUND IN A VIRTUAL WORLD

Moving around in the Data Detectives School simulation is possible in a number of ways. More specifically, your avatar has a choice of walking, running, or flying. In addition, your avatar can teleport to the different locations that contain the game clues (by clicking on the teleport pins on the maps located in the Data Detectives Game).

Walking -- You can use the arrow keys on your keyboard to walk your avatar around. Also, you can activate the Move Controls Box (that will provide you with arrow keys within your viewer screen -- to move your avatar around) by clicking on the "Avatar" drop down menu in the upper left-hand corner of your viewer and then clicking on "Movement Controls" (to place a "check" next to the feature so it will always be displayed in your viewer window).

Running -- If walking is too slow for you, you can activate the "Always Run" option on the "Avatar" + "Movement" menu (again, located on the upper left-hand side of your viewer).

Flying -- To begin flying, click on the "Fly" button (located in the Move Control Box). To stop flying, re-click the same "Fly" button (that will be labeled "Stop Flying" after you activate the fly option).

Teleporting -- Click on your "Map" and search for the location you want to visit and click "Teleport." In addition, you can use landmarks -- that contain teleport locations. Note: There are two maps with teleport landmarks to all the major clues in the Data Detectives Game.

HOW TO |INTERACT WITH OBJECTS

The interactive objects included in the Data Detectives School (tutorial centers and Data Detective Game) include:

- Note card givers -- are activated by touching the "giver" objects to receive a text note card;
- Embedded web pages -- open up automatically within your viewer when you touch an object that is linked to a web page;
- Media on a prim (MOAP) objects (like the calculator, whiteboard, or stopwatch) -- are activated automatically when an avatar approaches the object and further, just require touching the relevant buttons on the MOAP object;
- Slide show viewers -- are activated by using the red "forward" and "backward" arrows on each slide show viewer (in the tutorials included in the Data Detectives School); and
- Clue boxes (on your clue analysis station in the Data Detectives Game) -- are activated by touching the player button (for your player position = "Player #1," "Player #2," etc.) and then clicking on the "Build" button.

HOW TO | SET-UP YOUR VIEWER

The recommended viewer set-up (to enable the quick rezzing of all of the sculpted objects in the Data Detectives Game) includes increasing the Render Load Factor (or a change that will not impact the performance of your viewer).

To increase the Render Load Factor:

- After you are logged into MOSES, hold down your CTRL + ALT keys and then press the "D" key (to activate the Advanced menu tab on a PC or hold down the CTRL + OPT keys and then press the "D" to activate the Advanced menu tab on a Mac);
- Click on the Advanced menu (located in the upper left-hand portion of the viewer screen);
- Click on "Debug Settings," type in "RenderVolumeLODFactor," change the value to 8.0, and hit the enter button on your keyboard.

In addition, set-up your viewer draw distance to include at least 300 meters and as much as 400 meters, if possible. To increase the draw distance on your viewer:

- Click on the "Avatar" drop down menu in the upper left-hand corner of your viewer;
- Click on "Preferences";
- Use the slider control button to increase the draw distance; and
- Click on "Apply."

HOW TO | COMMUNICATE

When you are on the Data Detectives School simulation at the same time as other students and/or your instructor, you can communicate using text chat or voice chat. If your instructor is not online at the same time you are online, you can leave a text message for your instructor by locating one of the red telephone booths, clicking on the red button on the answering machine located in the telephone booth (see the attached picture), and typing your message into the "Nearby Chat" text window located in the lower left-hand side of your viewer screen (see the picture of the instructor message center telephone booth below).

To communicate via text chat with others in the Data Detectives Game at the same time you are in the Data Detectives Game, type a message into the "Nearby Chat" window and click on the enter button on your keyboard.

To communicate via voice chat (with others in the Data Detectives Game at the same time you are in the Data Detectives Game), you need to have a noise reduction headset attached to your computer (with the person you are trying to communicate with similarly outfitted with a noise reduction headset). Next, make sure voice is "enabled" on your viewer settings -- by clicking on the "Avatar" drop down menu, clicking on "Preferences," clicking on "Sound & Media," and making sure the box in front of "Enabled Voice" is checked. Also, click on the "Audio

Device Settings" button on the same window as above to make sure your headphone device is working properly. Finally, when you want to speak to someone, press the microphone button near the text chat box in the lower left-hand corner of your viewer.

HOW TO | USE YOUR INVENTORY

Everyone starts out with both an Inventory folder and a Library folder. You can retrieve items from the library, but you cannot use this area for storage. That is why you have an Inventory folder.

In turn, here are the recommended best practices for inventory management in a virtual world:

- Organize Inventory content/items each time you enter the virtual world. More specifically, try not to keep two or more copies of the same item.
- Sub folders are your friends. Sub folders can be named and moved to any other folder. Try to avoid having loose items floating around in main folders.
- Make a back-up copy of your inventory when possible. You can lose files and folders just as easily as you can in your first life.
- Make a point of emptying the trash before you leave. This way you will have more room for all the new cool stuff that you can get the next time you come in-world.

To rezz an object in your inventory, open up your inventory (by clicking on the suitcase icon in the lower right-hand side of your viewer). Next, just drag the object onto the ground to rezz the object in-world.

To open a note card in your inventory, open up your inventory, right click on the item and click on "Open."

To change avatar outfits (to an outfit in your inventory), open up your inventory, right click on the clothing item, and click on "Wear."

HOW TO | CHANGE YOUR APPEARANCE

In a 3D virtual world (like the OpenSimulator 3D virtual world that houses the Data Detectives School), you can look like nearly anyone, or anything, you want!

To make changes to your avatar's appearance:

- Right-click on yourself. Select "Appearance..."
- Click the "Edit Shape" tab to edit your body shape.
- Click the "Body" button. Now try moving the "Height" and "Thickness" sliders.
- Click the "Nose" button and try moving the "Nose Size" and "Nose Thickness" sliders. How about that!
- Try some of the other buttons and sliders. Click "Randomize" for a whole new look!
- If you don't like what you got, click "Revert" to go back to your original look.
- If you like what you see, click "Save As..." and choose a name for your new shape.

Remember that you can change your appearance anytime, as often as you want, for free -- so don't worry if everything isn't perfect. Move on any time you're ready.

APPENDIX TWO | GLOSSARY

Avatar. A graphic, cartoon-like, representation of a real life person.

Floater (also known as "hoover text"). Text that describes objects and appears to be floating above an object.

Grid. An entire virtual world (as in the OSGrid, MOSES, etc.).

HUD (or "handy utility device" or "heads-up display"). Provides a menu-like add-on to a viewer window that allows the user to utilize tool, animation, or gadget features and functions.

Lag. The inability of the server housing the grid and/or the users computer and/or the Internet bandwidth connection between the grid server and the user's computer to keep up with the demands of the software platform. In turn, lag results in a long delay time before the objects in the virtual world come into focus and/or stalled avatar movements.

Inventory. The objects, note cards, landmarks, clothing, etc. collected or created by a person when using a virtual world. Inventory items are associated with a particular avatar and are accessed by clicking on the suitcase icon in the lower right-hand corner of the viewer.

Landmark. The island location and coordinates associated with a particular spot in a virtual world.

Media-on-a-prim (or MOAP). The ability to display web pages on an object's surface in a virtual world set.

Non player character (also known as a NPC). Avatars that are not controlled by a real person.

Note card (spelled "notecard" in OS grid platform references). Text messages that are transmitted to avatars and stored in an avatar's inventory.

Permissions. Objects created in an open simulator virtual world can be given away with "full permissions" equal to the ability to modify the object, the ability to copy the object, and the ability to transfer the object. Alternatively, objects created in a virtual world can be given away with some combination of the abilities to modify, copy, and/or transfer the object. In addition, permissions can include the ability to move an object.

Prim. The basic building block in a 3-D virtual world.

Rezzing. Bringing objects or items into existence in a virtual world.

Script. A mini program used in a virtual world set.

Teleport. The movement of an avatar from one location in the virtual world to another location in the virtual world without flying or walking.

Touch. Using your mouse curser to click on an object.

Viewer. The software (like a browser window) that enables users to control their avatars to see and interact in a virtual world.

Voice-enabled. The ability to talk with others in the virtual world through a noise reduction headset.

Voting machine. A device that records an avatar's selection.

World map. The overhead [map] view of the entire virtual world.

REFERENCES

Critical Thinking About Data

Epstein, R. L., & Kernberger, C. (2005). *The guide to critical thinking in economic*s. Mason, OH: South-Western.

Leonard, J. (2007). E-Graphing: Perfection, Paradox or Persuasion. In T. Bastiaens & S. Carliner (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2007* (pp. 2077-2085). Chesapeake, VA: AACE.

Konnikova, M. (2011). Lessons from Sherlock Holmes (Series). *Scientific American*. http://blogs.scientificamerican.com/guest-blog/2011.

Other

BBC Online (2010). Where they stand: Guide to party election policies. *BBC News*. http://news.bbc.co.uk/2/hi/uk_news/politics/election_2010/8515961.stm

Higgins, A. & Kanter, J. (2012, November 22). Public anger over Europe's budget, and wine cellar, bubbles before talks. *The New York Times*, p. A16.

OECD (2006). *Infrastructure to 2030, telecom, land transport, water and electricity*. http://www.inst-informatica.pt/servicos/informacao-e-documentacao/biblioteca-digital/gestao-e-organizacao/0306011E.pdf

Stanley, A. (2012, July 28). In Ceremony, Britain Jests in Journey Through Past. *The New York Times*, p. D6

World Bank (2012). *Doing business 2013, smarter regulations for small and medium-size enterprises*. http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Annual-Reports/English/DB13-full-report.pdf