|  |  |  |  |
| --- | --- | --- | --- |
| **On-screen text, figures, etc.** | **Voice-over only (not text on-screen)** | | **Notes** |
| (See RQ mod doc for intros for all topics (#3 in Study1\_Summary.PPT, SECOND/THIRD SLIDE, NOT FIRST SLIDE): RQMod\_[date]\_withVariables\_ChoiceNoChoice.docx  And Variables\_ForRQs\_[date].docx) | | | |
| The research question you will be asked to design an experiment for is:  **(e.g., Does the *water temperature/etc*. affect the amount of crystal growth on a string in water?)** |  | |  |
| **Screen%20Shot%202017-11-29%20at%202.29.11%20PM.png**  **TED Intro**  **Welcome!**  **You are about to begin the TED Tutor.**  **Screen%20Shot%202017-11-30%20at%204.43.13%20PM.png** |  | | **This corresponds to #5 in Study1\_Summary PPT file…**  **We need to decide whether/how much of this to include in Study1**  **5/9/18: Use the new version Stef made (see below):** |
| Screen%20Shot%202017-11-27%20at%202.28.29%20PM.png  **Screen%20Shot%202017-11-30%20at%204.43.57%20PM.png**  **With it, you will learn a 3-step procedure for how to design good science experiments.** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.28.38%20PM.png**  **TED is a computer tutor.  Like a real teacher, TED provides instruction and feedback./Users/stefania/Desktop/Screen Shot 2017-12-07 at 9.50.12 AM.png** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.28.46%20PM.png**  **/Users/stefania/Desktop/Screen Shot 2017-12-07 at 9.50.12 AM.png**  **Also like a real teacher, TED looks at your answers to see how well you are learning how to design good experiments.** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.28.53%20PM.png/Users/stefania/Desktop/Screen Shot 2017-12-07 at 9.50.20 AM.png**  **If you answer TED’s questions correctly, it will assume that you have learned the material and are ready to advance.** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.41.54%20PM.png**  **If you answer TED’s questions incorrectly, it will assume that you need extra help and more practice./Users/stefania/Desktop/Screen Shot 2017-12-07 at 9.50.27 AM.png** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.29.01%20PM.png**  **You will move through TED’s instruction at your own pace.** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.29.08%20PM.png/Users/stefania/Desktop/Screen Shot 2017-12-07 at 9.58.50 AM.png**  **You may find that sometimes you go “backwards” and repeat questions.** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.29.15%20PM.png**  **This is because TED has determined, based on your answers, that you need more practice before you can move forward. /Users/stefania/Desktop/Screen Shot 2017-12-07 at 10.04.50 AM.png** |  | |  |
| **Screen%20Shot%202017-11-27%20at%202.29.22%20PM.png**  **The only way for TED to know how much you are learning is through your answers to its questions./Users/stefania/Desktop/Screen Shot 2017-12-07 at 10.11.55 AM.png**  **/Users/stefania/Desktop/Screen Shot 2017-12-07 at 10.12.02 AM.png** |  | |  |
| **/Users/stefania/Desktop/Screen Shot 2017-12-07 at 10.16.19 AM.pngScreen%20Shot%202017-11-27%20at%202.29.34%20PM.png**  **For this reason it’s important to make sure you understand what each question is asking and to answer carefully./Users/stefania/Desktop/Screen Shot 2017-12-07 at 2.43.58 PM.png** |  | |  |
| **General Intro**  Today we're going to learn how to design good science experiments.  A good science experiment is one that lets you find out about something. | Let’s begin. | | **We need to decide whether to include in Study1**  **5/9/18: Omit for Study 1 (too long; want students to design experiment and get into instruction for their chosen experiment ASAP).** |
|  | | | |
|  |  | NO Ramp pretest (in ISP Study 1);  NO R0 or R0/1 remediation | |
|  |  | **((R012: See R012.docs, which the following was based on…))** | |
| **If you answer questions incorrectly, TED will think you need more help and will ask you more questions.** |  | **(This corresponds to #5 in Study1\_Summary flowchart)**    **((something about answering carefully/accurately as possible so do not have to repeat instruction;**  In user-testing, can see if Ss realize that they needed to answer more questions when they get answers wrong. | |
|  |  |  | |
| **Screen%20Shot%202017-11-29%20at%208.54.18%20AM.png**  **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)1]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)2]** | **[select V3 value]** | **[select V3 value]** | | **[V(un-chosen)3]** | **[select V4 value]** | **[select V4 value]** | | In this table, click on the one variable you are testing in this experiment: | **(This corresponds to #6 in Study 1 summary PPT flowchart: “Procedural R0/1/2 training)**  **[1]**  **Note: V(chosen) isn’t necessarily the first variable in the table. Can have variable names fixed in table, but will obviously vary by T(chosen), or TV.** | |
| Screen%20Shot%202017-11-29%20at%208.59.59%20AM.png  **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)1]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)2]** | **[select V3 value]** | **[select V3 value]** | | **[V(un-chosen)3]** | **[select V4 value]** | **[select V4 value]** | | That’s right!  You correctly identified the one variable you are testing ~~for~~ this experiment. | [to [2]]  I was trying to make the shades of green in RQ and in table the same, but was unable to do. They should be exact same shades in TED. (I like the shade in the table better.)  Note: UNDERLINE TV once student IDs it. | |
| **Screen%20Shot%202017-11-29%20at%209.08.40%20AM.png**  **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)1]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)2]** | **[select V3 value]** | **[select V3 value]** | | **[V(un-chosen)3]** | **[select V4 value]** | **[select V4 value]** | | Actually, that is not the one variable that you are testing ~~for~~ this experiment.  Please try again. | [to [1]]  (reddish—but not too dark of red color to be too “shocking”—highlight the non-TV chosen) | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)1]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)2]** | **[select V3 value]** | **[select V3 value]** | | **[V(un-chosen)3]** | **[select V4 value]** | **[select V4 value]** | | Now choose the [V(chosen/given)] for each condition that will allow you to see if the [A(chosen/given)-T(chosen/given n)-V(chosen/given)] affects the [DVs-A(chosen/given)-T(chosen/given)]. | (Note: Still #6 in Study1\_Summary, Slide 2 & 3 flowchart)  [3]  R01 for TV. | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | You’re right! The variable that you’re testing should be different for each condition.  If the variable is different, you can compare and contrast the effects of the variable. | Not sure about this wording… | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L1/L2** | | **[V(un-chosen)1]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | Actually, that is incorrect.  Please try again. | [to [3]] | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | Now you must decide ~~choose~~ ~~what to do with~~ how to set up the other variables in this experiment. | (still #6 in flowchart) | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | Let’s start with the [V(not-chosen/given)1]. |  | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | Select which [V(not-chosen/given)1a] you would use for each condition in order to find out whether the  [V(chosen/given)]  —and ONLY the [V(chosen/given)]—  has an effect on the [DVs-A(chosen/given)-T(chosen/given)]. | R2 (v(not-chosen)1) | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **V2-L1/L2** | **V2-L1/L2** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | You’re right! Anything you’re not testing should be kept the same between the two conditions. | In general, green-highlighted means correct, but (I’m thinking a more vibrant shade of green for the TV than non-TVs.  [To [4]] | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **V2-L1/L2** | **V2-L2/L1** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | Actually, anything you’re not testing should be kept the same between the two conditions.  Please correct the experiment. |  | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V1-L1/L2** | **V1-L2/L1** | | **[V(un-chosen)1]** | **V2-L1/L2** | **V2-L1/L2** | | **[V(un-chosen)2]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | **Now, select which** [V(not-chosen/given)2a]  you would use for each condition in order to find out whether the  [V(chosen/given)]  —and ONLY the [V(chosen/given)]—  has an effect on the [DVs-A(chosen/given)-T(chosen/given)]. | **[4]**  R2 (v(not-chosen)2) | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L1/L2** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | You’re right!  Anything you’re not testing should be ~~kept~~ the same ~~between the two conditions~~. | [To [5]] | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L2/L1** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | Actually, anything you’re not testing should be kept the same between the two conditions.  Please correct the experiment. |  | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L1/L2** | | **[V(un-chosen)3]** | **[select V3 value]** | **[select V3 value]** | | **Finally, select which** [V(not-chosen/given)3a]  you would use for each condition in order to find out whether the  [V(chosen/given)]  —and ONLY the [V(chosen/given)]—  has an effect on the [DVs-A(chosen/given)-T(chosen/given)]. | **[5]**  R2 (v(not-chosen)3) | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L1/L2** | | **[V(un-chosen)3]** | **V3-L1/L2** | **V3-L1/L2** | | Good!  Anything you’re not testing should be ~~kept~~ the same ~~between the two conditions~~. | [To [6]] | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L1/L2** | | **[V(un-chosen)3]** | **V3-L2/L1** | **V3-L1/L2** | | Actually, anything you’re not testing should be kept the same between the two conditions.  Please correct the experiment. | [to [6]] | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  |  | | --- | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | **Across cond’s** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | **Different** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** |  | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L1/L2** |  | | **[V(un-chosen)3]** | **V3-L2/L1** | **V3-L1/L2** |  | | You have set up a good experiment to find out whether the **[A(chosen)-T(chosen)-V(chosen)] affects the [DVs-A(chosen)-T(chosen)].**  **The one variable you are testing is different across conditions.** | (New scene)  (Add final column) | |
| **Does the [A(chosen)-T(chosen)-V(chosen)] affect the [DVs-A(chosen)-T(chosen)]?**   |  |  |  |  | | --- | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | **Across cond’s** | | **[V(chosen)]** | **V-L1/L2** | **V-L2/L1** | **Different** | | **[V(un-chosen)1]** | **V1-L1/L2** | **V1-L1/L2** | **Same** | | **[V(un-chosen)2]** | **V2-L1/L2** | **V2-L1/L2** | **Same** | | **[V(un-chosen)3]** | **V3-L2/L1** | **V3-L1/L2** | **Same** | | And all other variables are the same across conditions.  ((This way, only the V(chosen) can cause any difference you find in the result.)) | ((further explanation here??))  OR  Have STUDENT select reason for R2/controlling variables?? | |
| (repeat above for second experiment for V(chosen)? | | | |
| **../../../../../Desktop/Screen%20Shot%202017-11-29%20at%2011.04.46**  **[??]** | **Now we’ll look at how some other students have set up some experiments of their own**  **for the topic of** [A(chosen/given)-T(chosen/given)**.** | | **(this section corresponds to #8 in Study 1\_Summary flowchart: ExpB w/ FF)**  **[6]**  **5/9/18: This intro to Experiment B will have to be incorporated into TED (I think).** |
| **../../../../../Desktop/Screen%20Shot%202017-11-29%20at%2011.04.52**  **[??]** | **Remember to THINK and work carefully so that TED can tell whether or not you need extra help.**  **If you answer quickly and incorrectly, you will be asked more questions than if you answer carefully and correctly.** | | **Could have something like “person thinking” image for this slide??** |
|  |  | |  |
| ../../../../../Desktop/Screen%20Shot%202017-11-29%20at%2010.51.57  **[??]** | ~~Next, we’ll show you two different experiments.~~  Each experiment set up by some other students  ~~Each one~~ might either be a good or a bad experiment. | | **[7]** |
| **../../../../../Desktop/Screen%20Shot%202017-11-29%20at%2011.06.28**  **[??]** | **A “good” experiment will let you figure out if the variable you are testing really does OR really does not make a difference.** | |  |
|  | **We will ask you if you think each experiment is a good or bad experiment.** | |  |
| **Screen%20Shot%202017-11-29%20at%202.11.14%20PM.png**  **Experiment #1**  **Research Question:**  **Does the [V(not-chosen/given)1]**  **affect the [DVs-A(chosen/given)-T(chosen/given)]?** | **In the first experiment,**  **Some students need to find out whether the [**V(not-chosen/given)1]  **affects the [**[DVs-A(chosen/given)-T(chosen/given)].  They designed the following experiment… | | (this experiment is maximally confounded, where all variables are contrasted across conditions) |
| **Screen%20Shot%202017-11-29%20at%201.59.54%20PM.png**  **[[pictures of variable values]]** | The **[**V(not-chosen/given)1] for Condition 1 is **[**V(not-chosen/given)1-L1] and  The **[**V(not-chosen/given)1] for Condition 2 is **[**V(not-chosen/given)1-L2]. | | Do we want to use pictures-only (as in the TED2-final) or tables? (I don’t think it’s possible to have both on-screen at once though.)  (The TV here is the same TV for Exp #1; we will start the set-up description with the TV in general, to get students thinking similarly.) |
| **Screen%20Shot%202017-11-29%20at%201.59.54%20PM.png** | The **[**V(not-chosen/given)2] for Condition 1 is  **[**V(not-chosen/given)2-L1] and  The **[**V(not-chosen/given)2] for Condition 2 is  **[**V(not-chosen/given)2-L2] | |  |
| **Screen%20Shot%202017-11-29%20at%201.59.54%20PM.png** | The **[**V(not-chosen/given)3] for Condition 1 is  **[**V(not-chosen/given)3-L1] and  The **[**V(not-chosen/given)3] for Condition 2 is  **[**V(not-chosen/given)3-L2] | |  |
| **Screen%20Shot%202017-11-29%20at%201.59.54%20PM.png** | The **[**V(chosen/given)] for Condition 1 is  **[**V(chosen/given)-L1] and  The **[**V(chosen/given)] for Condition 2 is  **[**V(chosen/given)-L2] | | This is the original TV the student chose to investigate. |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.42.20 PM.pngIs this a good way to design the experiment?** | Think about the students’ problem, and the experiment that they designed.  **Is this a good way to design the experiment?** | |  |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.43.18 PM.pngWhy did you say it was not a good way?** | Right, it is NOT a good experiment.  **Why did you say it was not a good way?** | | (correct response) |
| **~~/Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.44.08 PM.pngWhat is the best reason for why this is actually not a good experiment?~~**  **Why is this actually NOT a good experiment?** | Actually, it is NOT a good experiment.  Even though you said it was a good experiment, try to [select from the drop-down menu the best reason for/explain] why this is actually NOT a good experiment.  Explain why this is actually NOT a good experiment. | | (incorrect response)  Change “not good” to “bad”? More direct. |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.51.59 PM.png**  **The** [DVs-A(chosen/given)-T(chosen/given)] **may either be the same or different across conditions.**  **Imagine the results/[**DVs-A(chosen/given)-T(chosen/given)] **were different across conditions.**  **Could you tell for sure that the**  **[V(not-chosen/given)1] caused the difference?** | **The** [DVs-A(chosen/given)-T(chosen/given)] **may either be the same or different across conditions.**  **Imagine the results/[**DVs-A(chosen/given)-T(chosen/given)] **were different across conditions.**  **Could you tell for sure that the**  **[V(not-chosen/given)1] caused the difference?** | | ((Problematic that text and voice-over the same??))  This is the TV for Exp A. |
| /Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.54.38 PM.png  Results for Condition 1 = Results for Condition 2 <or>  Results for Condition 1 ≠ Results for Condition 2  **IF: Results for Condition 1 ≠ Results for Condition 2…**  **Could you tell for sure that the**  **[V(not-chosen/given)1] caused the difference?** | **The** [DVs-A(chosen/given)-T(chosen/given)] **may either be the same or different across conditions.**  **Imagine the results/[**DVs-A(chosen/given)-T(chosen/given)] **were different across conditions.**  **Could you tell for sure that the**  **[V(not-chosen/given)1] caused the difference?** | | (alternative for row above) |
|  | You’re right; we could not tell for sure that the  [V(not-chosen/given)1]  caused the difference.  That is, we could not tell for sure that one  [V(not-chosen/given)1a] caused a greater  [DVabb-A(chosen/given)-T(chosen/given)]  than the other [V(not-chosen/given)1a]. | | (correct response) |
|  | Actually; we could NOT tell for sure that the  [V(not-chosen/given)1]  caused the difference.  That is, we could not tell for sure that one  [V(not-chosen/given)1a] caused a greater  [DVabb-A(chosen/given)-T(chosen/given)]  than the other [V(not-chosen/given)1a]. | | (incorrect response) |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.56.13 PM.pngWhy did you say you could NOT know for sure?** | **Why did you say you could NOT know for sure?** | | (correct response) |
| **~~What is the best reason for why you actually could not tell for sure?~~**  **~~/Users/stefania/Desktop/Screen Shot 2017-12-04 at 1.56.43 PM.png~~**  **Why could you actually not tell for sure?** | Even though you said you COULD tell for sure, try and explain the best reason for why you actually could NOT tell for sure from this experiment that the [V(not-chosen/given)1] caused the difference. | | (incorrect response) |
| Feature focus: Spring2013\_Script\_FF\_NOT\_FINAL.docx (is there a newer version??) | | | |
| **Screen%20Shot%202017-11-29%20at%203.50.13%20PM.png**  **Research Question:**  Does the **[V(not-chosen/given)1]** affect the[DVs-A(chosen/given)-T(chosen/given)]?   |  |  |  |  | | --- | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | **Cause any diff?** | | **[V(un-chosen)1]** | **V1-L1** | **V1-L2** | **Could cause** | | **[V(un-chosen)2]** | **V2-L1** | **V2-L2** | **could/not** | | **[V(un-chosen)3]** | **V3-L1** | **V3-L2** | **could/not** | | **[V(chosen)]** | **V-L1** | **V-L2** | **could/not** | | In this experiment, the students are testing for whether or not the **[V(not-chosen/given)1]** makes a difference for the result.  Because the **V(not-chosen/given)1** is different across conditions, it COULD cause a difference in the results.  Could the way they have set up each of these other variables cause there to be a difference in the [DVs-A(chosen/given)-T(chosen/given)] between conditions?  Make a selection for each of the other variables. | | **(This is what we called the “feature-focus” part of the instruction)**  **(Should we add a column in previous section for “could/could not” cause a difference in results Maybe not; incrementally add instructional components…)** |
| **Screen%20Shot%202017-11-29%20at%203.50.13%20PM.png** | They have set the  [V(not-chosen/given)2]  to be different across conditions.  [Actually/You are correct that] the different [V(not-chosen/given)2] across conditions COULD cause a difference in the [DVs-A(chosen/given)-T(chosen/given)]. | | **Should we have Ss change wrong responses (or do it automatically, like now)? (Having student be active, especially for such a critical concept, seems important.)** |
| **Screen%20Shot%202017-11-29%20at%203.50.13%20PM.png** | The students made the [V(not-chosen/given)3] different across conditions.  [Actually/You are correct that] the different [V(not-chosen/given)3] across conditions  could also cause a difference in the [DVs-A(chosen/given)-T(chosen/given)] across conditions. | |  |
| **Screen%20Shot%202017-11-29%20at%203.50.13%20PM.png** | [Actually/You are correct that] the different [V(chosen/given)]  across conditions  could also cause a difference in the [DVs-A(chosen/given)-T(chosen/given)]  across conditions. | | **(this is the variable students initially chose)** |
| **Screen%20Shot%202017-11-29%20at%203.50.13%20PM.png** | So, in this experiment, even though the students are testing the [V(not-chosen/given)1] ,  the [V(not-chosen/given)2],  the [V(not-chosen/given)3], and the [V(chosen/given)] all also could cause a difference in [DVs-A(chosen/given)-T(chosen/given)]. | |  |
| **Screen%20Shot%202017-11-29%20at%203.50.13%20PM.png** | Please correct this experiment by clicking in the table and selecting correct ways to set up the [V(not-chosen/given)2], [V(not-chosen/given)3], and [V(chosen/given)]. | |  |
| Screen%20Shot%202017-11-29%20at%203.53.05%20PM.png | Explain why this is a good way to find out whether or not the [V(not-chosen/given)1] makes a difference. | |  |
|  | **This is a good experiment** [because everything is the same except for what the students are trying to find out about, the [V(not-chosen/given)1]. | |  |
|  | In other words, if there is a difference between conditions in the [DVs-A(chosen/given)-T(chosen/given)], it has to be because of the different [V(not-chosen/given)1] across conditions.  And if there is no difference in between conditions in the [DVs-A(chosen/given)-T(chosen/given)],  then you/they?? could know that the [V(not-chosen/given)1] does not matter. So from this experiment, you/they?? would be able to find out whether or not the [V(not-chosen/given)1] causes a difference in the result. | |  |
| 2014\_Spring\_ei question flow.vsdx | | | |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.09.39 PM.pngExperiment #2**  **Research Question:**  **Does the [**V(not-chosen/given)2]  **affect the** [DVs-A(chosen/given)-T(chosen/given)]. | **Another group of students need to find out whether the [**V(not-chosen/given)2]  **affect the** [DVs-A(chosen/given)-T(chosen/given)].  They designed the following experiment:  The **[**V(not-chosen/given)2] for Condition 1 is **[**V(not-chosen/given)2-L1] and  The **[**V(not-chosen/given)2] for Condition 2 is **[**V(not-chosen/given)2-L2].  The **[**V(not-chosen/given)3] for Condition 1 is  **[**V(not-chosen/given)3-L2] and  The **[**V(not-chosen/given)3] for Condition 2 is  **[**V(not-chosen/given)3-L2]  The **[**V(chosen/given)] for Condition 1 is  **[**V(chosen/given)-L1] and  The **[**V(chosen/given)] for Condition 2 is  **[**V(chosen/given)-L1]  The **[**V(not-chosen/given)1] for Condition 1 is  **[**V(not-chosen/given)3-L1] and  The **[**V(not-chosen/given)1] for Condition 2 is  **[**V(not-chosen/given)3-L2] | | (**this corresponds to #9 in flowchart)**  There is one confounded variable in this experiment.   * Let’s make the confound be type of string.   Current TV (note: always starting description with current TV, to support students’ meta-strategic knowledge). |
| /Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.13.12 PM.png  **Is this a good way to design the experiment?** | Think about the students’ problem, and the experiment that they designed.  **Is this a good way to design the experiment?** | |  |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.15.26 PM.png**  **Why did you say it was not a good way?** | Right, it is NOT a good experiment.  **Why did you say it was not a good way?** | | (correct response) |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.16.08 PM.pngWhat is the best reason for why this is actually not a good experiment?** | Actually, it is NOT a good experiment.  Even though you said it was a good experiment, try to [select from the drop-down menu the best reason for/explain] why this is actually NOT a good experiment. | | (incorrect response)  (drop-down version of TED) |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.19.31 PM.pngThe [DVs-A(chosen/given) -T(chosen/given)] may either be the same or different across conditions.**  **Imagine the results/[DVs-A(chosen/given)-T(chosen/given)] were different across conditions.**  **Could you tell for sure that the [V(not-chosen/given)2a] caused the difference?** | **The** [DVs-A(chosen/given)-T(chosen/given)] may either be the same or different across conditions.  **Imagine the results/[**DVs-A(chosen/given)-T(chosen/given)] **were different across conditions.**  **Could you tell for sure that the** [V(not-chosen/given)2a]  **caused the difference?** | | (see alternative scene above, for Exp 1) |
| /Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.21.08 PM.png  **Why did you say that you could not know for sure?** | [You’re right; we could not tell for sure that the [V(not-chosen/given)2] caused the difference.  That is, we could not tell for sure that one  [V(not-chosen/given)2a]  caused the  [DVabb-A(chosen/given)-T(chosen/given)] to be more than the  other [V(not-chosen/given)2a].  **Why did you say that you could not know for sure?** | | (correct: Student says “could not tell for sure”) |
| /Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.21.08 PM.png | Actually; we could not tell for sure that the [V(not-chosen/given)2]  caused the difference.  That is, we could not tell for sure that one  [V(not-chosen/given)2a]  caused the  [DVabb-A(chosen/given)-T(chosen/given)] to be more than the  other [V(not-chosen/given)2a]. | | (incorrect: Student says “could tell for sure”) |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 3.22.40 PM.pngWhat is the best reason for why you actually could not tell for sure?** | Even though you said you COULD tell for sure, try and explain the best reason for why you actually could NOT tell for sure from this experiment that the [V(not-chosen/given)2]caused the difference. | | (incorrect: Student says “could tell for sure”) |
| Feature focus  Spring2013\_Script\_FF\_NOT\_FINAL.docx (is there a newer version??) | | | |
| Screen%20Shot%202017-11-30%20at%2010.12.30%20AM.png | In this experiment, the students are testing for whether or not the [V(not-chosen/given)2] makes a difference for the result.  Could the way they have set up each of these other variables cause there to be a difference in the [DVs-A(chosen/given)-T(chosen/given)] between conditions?  Make a selection for each of the other variables. | | **Sweller/etc.: simultaneous audio and (same) text impairs understanding. (a) Why? (b) True for middles school-aged children? (c) how to coordinate audio and on-screen text??**  **This is still Experiment #2.**  **Stef: This is the “feature-focus” section of Exp 2, which is analogous to that section for Exp 1.** |
| Screen%20Shot%202017-11-30%20at%2010.12.30%20AM.png | They have set the [V(not-chosen/given)3] to be the same across conditions.  [Actually/You are correct that] the same [V(not-chosen/given)3a] across conditions could NOT cause a difference in the [DVs-A(chosen/given)-T(chosen/given)]. | | **EXPERIMENT WHERE COMPARE EXACT TEXT AND VOICE-OVER TO SOMEWHAT DIFFERENT TEXT AND VOICE-OVER???**  **((OR, LOOK AT STUDIES ON THIS…))** |
| Screen%20Shot%202017-11-30%20at%2010.12.30%20AM.png | The students made the [V(chosen/given)] the same across conditions.  [Actually/You are correct that] the same [V(chosen/given)] across conditions could NOT cause a difference in the [DVs-A(chosen/given)-T(chosen/given)] across conditions. | |  |
| Screen%20Shot%202017-11-30%20at%2010.12.30%20AM.png | The students made the [V(not-chosen/given)1] different across conditions.  [Actually/You are correct that] the different [V(not-chosen/given )1] across conditions  COULD cause a difference in the [DVs-A(chosen/given)-T(chosen/given)] across conditions. | |  |
| Screen%20Shot%202017-11-30%20at%2010.12.30%20AM.png | So, in this experiment, even though the students are testing the [V(not-chosen/given)2] , the [V(not-chosen/given)1],  also could cause a difference in [DVs-A(chosen/given)-T(chosen/given)]. | |  |
| **Screen%20Shot%202017-11-30%20at%2010.12.30%20AM.png** | Please correct this experiment by clicking in the table and selecting the correct way to set up the [V(not-chosen/given)1]. | |  |
| **Explain why this is a good way to find out whether or not the [V(not-chosen/given)2] makes a difference./Users/stefania/Desktop/Screen Shot 2017-12-04 at 2.05.20 PM.png** | **Explain why this is a good way to find out whether or not the [V(not-chosen/given)2] makes a difference.** | |  |
| **This is a good experiment!/Users/stefania/Desktop/Screen Shot 2017-12-04 at 2.06.23 PM.png** | **This is a good experiment** because everything is the same except for what the students are trying to find out about, the [V(not-chosen/given)2]. | |  |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 2.06.23 PM.png** | In other words, if there is a difference between conditions in the [DVs-A(chosen/given)-T(chosen/given)], it has to be because of the different [V(not-chosen/given)2] across conditions. | |  |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 2.06.23 PM.png** | And if there is no difference between conditions in the [DVs-A(chosen/given)-T(chosen/given)], then you/they?? could know that the [V(not-chosen/given)2] does not matter. | |  |
| **/Users/stefania/Desktop/Screen Shot 2017-12-04 at 2.06.23 PM.png** | So from this experiment, you/they?? would be able to find out whether or not the [V(not-chosen/given)2] causes a difference in the result. | |  |
|  | | | |
| **Screen%20Shot%202017-11-29%20at%203.21.45%20PM.pngSet up experiments on your own now!**  First, design an experiment that will let you find out for sure whether or not the [V(chosen/given)] affects [DVs-A(chosen/given)-T(chosen/given)].   |  |  |  | | --- | --- | --- | | **Variables** | **Condition 1** | **Condition 2** | | **[V(chosen)]** | **[select V1 value]** | **[select V1 value]** | | **[V(un-chosen)1]** | **[select V2 value]** | **[select V2 value]** | | **[V(un-chosen)2]** | **[select V3 value]** | **[select V3 value]** | | **[V(un-chosen)3]** | **[select V4 value]** | **[select V4 value]** | | Let’s see how you design experiments on your own. You’ll design four experiments.  First, design an experiment that will let you find out for sure whether or not the [V(chosen/given)] affects [DVs-A(chosen/given)-T(chosen/given)].  You can change part of the experiment by simply clicking in the table. | | **(this corresponds to #11: Domain-specific posttest in flowchart)**  The first experiment designed in the Domain-Posttest will be for the initial variable they selected/were given.  **Put all Qs in RQ format??**  **((Note: V(chosen) not necessarily first variable in the table))** |
| **Screen%20Shot%202017-11-29%20at%203.22.52%20PM.png** | I want to see what you LEARNED from this lesson.  So, I won’t tell you if you are right or wrong.  When you’re done working, click the next button. | | Is switching between “I” and “We” a problem? |
| **Screen%20Shot%202017-11-30%20at%2010.24.29%20AM.png** | Explain why you designed your experiment the way that you did. | |  |
| **Design an experiment that will let you find out for sure whether or not the** [V(not-chosen/given)1] **affects** [DVs-A(chosen/given)-T(chosen/given)].  **Screen%20Shot%202017-11-29%20at%203.27.36%20PM.png** | Design an experiment that will let you find out for sure whether or not the [V(not-chosen/given)1] affects [DVs-A(chosen/given)-T(chosen/given)]. | |  |
| **Design an experiment that will let you find out for sure whether or not the** [V(not-chosen/given)2] **affects** [DVs-A(chosen/given)-T(chosen/given)]**.**  **Screen%20Shot%202017-11-29%20at%203.27.36%20PM.png** | Design an experiment that will let you find out for sure whether or not the [V(not-chosen/given)2] affects [DVs-A(chosen/given)-T(chosen/given)]. | |  |
| **Design an experiment that will let you find out for sure whether or not the** [V(not-chosen/given)3] **affects** [DVs-A(chosen/given)-T(chosen/given)]**.**  **Screen%20Shot%202017-11-29%20at%203.27.36%20PM.png** | Design an experiment that will let you find out for sure whether or not the [V(not-chosen/given)3] affects [DVs-A(chosen/given)-T(chosen/given)]. | |  |
| **Lesson Summary:**  **The skills you have learned in this lesson can be applied any time you set up any experiment,**  **in any domain.**  **That is, anytime you set up an experiment, you need to make everything the same except for the one variable you are testing.**  **This way, only that one variable you are testing can cause the result.**  **((REPLACE AT LEAST SOME TEXT WITH IMAGES??? Maybe images of good experiment))** | The skills you have learned in this lesson can be applied any time you set up any experiment,  in any domain.  That is, anytime you set up an experiment, you need to make everything the same except for the one variable you are testing.  This way, only that one variable you are testing can cause the result. | | **(I changed the wording to end instruction on the rationale for controlling)**  **Should this Lesson Summary instead be BEFORE domain posttest??** |
| ((END)) |  | |  |