**PhET Workshop Outline:**

**Learning goals:**

Can incorporate research and teaching so that work on each compliments the other.

Different ways to incorporate sims into class (lecture, homework, lab, in-class activities).

Know the different types of papers that are appropriate to the 4 mainstream U.S. physics journals.

Knowledge of existing diagnostic tools and type of data that can show effectiveness of implementation.

Engagement and content knowledge.

Identify a project(s) for the next year with possible collaborator.

**Preparation:**

Materials to bring:

Nametags (40)

Markers for nametags (5)

Sign up sheet (name, affiliation, email)

**Folder contents** (30 folders):

1. Research Papers w/ summary of journal guidelines:

Physics Teacher Paper (2010)

AJP Photoelectric Effect

PRST CCK

PERC CLASS

1. Resource sheet that has links for diagnostic tools (FCI, BEMA, CSEM, CLASS, Washington, Mazur, Redish Book), links to mailing lists YOUNGPER and PhysLRNR, PhEThelp
2. List of studies that we’ve done.
3. Completion certificate
4. Scrap paper
5. Pen
6. PhET business card
7. Feedback to us about workshop.

**Workshop General outline (4 hours total):**

1) (1.5 hours)

Present slides / group discussion

Covering: Engagement and Constructivism, Unique features of sims, how you’d use sims in class, what makes these sims effective tools, Overview of PhET research studies that have been done. Types of data that can be collected – resources for these. HRC, Funding opportunities???

2) (2.25 hours plus 10 min break)

Participants partner up and do the following:

* Discuss sims they’ve used and how. Identify sims or ways to use sims they’d like to try.
* Journal activity I: What is different about each? What can go in each.
* Share with whole group and sum up on white board.
* Journal activity II: Look at data that is in each article and compare. Where would your ideas fit?
* Discuss things already tried in your course(s). Think about something done that could be written up. If it’s interesting to your partner and they are very curious about the details, that’s a good sign that it’s interesting enough to write up.
* Figure out if you have evidence for your project that it worked. What evidence do you wish you collected? How can you get this next time? What Journal can it go in now. How about after you have the data that you want.
* Whole group discussion. Examples for each if possible.
* Think about a possible study where you incorporate PhET sims in a new way and then measure the impact. Collaborate if possible – i.e. Each do it at your institution and then compare results.
* Share with whole group – give/get feedback

3) (5 min) Feedback/lingering questions

**Time line for workshop:**

|  |  |  |
| --- | --- | --- |
| **Arrival** |  | **Fill out name tag / sign up sheet**  **HANDOUT: Folder** |
| **1:00** | **45 min** | **SLIDES:** Intro to PhET, Unique features of sims, a few studies we’ve done, types of data collected, diagnostic tools available, HRC. |
|  | **45 min** | Various places set for discussion. Actual slides are 45 min worth, 45 min discussion. |
| **2:30** | **5 min** | Intro to rest of day … most of the time spent on thinking about what you’ve done that’s research and how you could incorporate sims and test the impact. |
|  | **5 min** | Intros (Name, Email, School, What you teach, Course you’re focused on today).  Each person introduces themselves and their interest. |
|  | **5 min** | Mingle and **find a partner.** |
|  |  |  |
|  | **5 min** | Break |
| **2:50** | **5 min** | Sims used, ways used, sims you’d like to try and ways to use. |
|  | **10 min** | Group discussion about this |
| **3:05** | **15 min** | Journal Activity I: What is different about each? What can go in each? |
| **3:20** | **10 min** | **WHOLE GROUP:** Sum up as a group the differences and what is appropriate for each |
| **3:30** | **20 min** | Journal Activity II: Look at research question and data that is in each article and compare.   * Where would your ideas fit? Discuss things already tried in your course(s). Think about something done that could be written up. If it’s interesting to your partner and they are very curious about the details, that’s a good sign that it’s interesting enough to write up. |
|  | **10 min** | Figure out if you have evidence for your project that it worked. What evidence do you wish you collected? How can you get this next time? What Journal can it go in now? How about after you have the data that you want? |
| **4:00** | **15 min** | **WHOLE GROUP:** Find example of article for each journal. |
| **4:15** | **20 min** | Create a study:   * Think about a possible study where you incorporate PhET sims. Either new sims and/or in a new way. Research question: What do you expect it to do for the students or for you? What data will you collect to measure the impact? Collaborate if possible – i.e. Each do it at your institution and then compare results. |
| **4:35** | **20 min** | **WHOLE GROUP**: Each group shares their research plan   * What should it help students do? * Will the data reveal the impact? |
|  |  |  |
| **4:55pm** | **5 min** | **Lingering Questions?  *Feedback forms*** |
|  |  |  |
|  |  |  |