**The zen of learning laboratory physics through writing and the art of peer review**

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**Why write?**

Communication is a critically important scientific activity. When we, as scientists, write, we synthesize information into a coherent physical description. Our understanding of what we have done in an investigation is solidified through the process of endeavoring to write for ourselves and also for our peers.

Communication skills are also highly valued for all career paths. Physics graduates need to be able to communicate technical information clearly and concisely for future success!

For writing to be most useful to the author, it is necessary that the author write about something in which they are invested. For students, this is very different from writing a term paper in an English or Physics class. We need the students to write about something they have a connection to, not simply the theoretical.

Hopefully, students have a connection to what they are doing in laboratory. Therefore, writing about a laboratory investigation they have performed should result in a more meaningful writing experience.

**Assessment in laboratory**

It is difficult to assess what students gain from laboratory experiences. We can make observations of what they do in laboratory, but this does not determine what they understand. Often we make students write about their laboratory investigations as an assessment tool.

Unfortunately, the students write for the **wrong audience**; the instructor who knows all. This ignorance of audience leads them to perform a “knowledge telling” exercise rather than a “knowledge transforming” exercise. They do not accept their responsibility to “know” and understand what they did.

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**Peer Review**

The process of peer review for scientific writing serves many purposes: forming a community of scholars, checking scientific accuracy and interest to community, and enforcing an audience on the author.

**JAUPLI to the rescue**

For students, peer review can be very helpful in defining a proper audience for writing. Unfortunately, we often have small advanced laboratory classes and so blind peer review can be challenging.

**Advanced Laboratory and JAUPLI – Journal of the Advanced Undergraduate Physics Laboratory Investigation**

http://opus.ipfw.edu/jaupli/

JAUPLI is an online journal as an educational tool. It is intended that students write about their advanced laboratory projects. These papers are reviewed by their peers at other institutions.

We ran trials of JAUPLI in the Spring 2011, Fall 2011 and Spring 2012 semesters. These trials included ~70 students from six different universities. At the close, we had an anonymous survey of the students (35 respondents).

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