

Department of Physics

Drs. Ken Kihlstrom, Warren Rogers, Michael Sommermann

Primary Departmental Program Goals

1. **Classroom Teaching** - Training of Departmental Teaching Assistants
2. **Scientific Writing - Laboratory Abstracts** - Writing of Laboratory Abstracts
3. **Student Research and Practica** - quality of student extra-curricular accomplishments

Focus: Scientific Writing – Laboratory Abstracts

Program Goal – Improved skills in scientific writing – that students become better able to articulate in clear, scientific terms their experimental **objective, procedure, analysis, results, and conclusions.**

The quality of their written work will approach the quality of that found in published scientific journals.

Note: This goal also addresses both **program specific** and **institutional learning standards**



Westmont students Shea and Evan Mosby working with the Cosmic Muon Detector Array (CMDA)

Departmentally Established Guidelines for Laboratory Abstracts

- Concise summary, or overview, of the experiment and results
- Targets an audience with a scientific background
- Brief, informative overview of your experiment and results
- Further experimental detail left for inside the report
- Should include the following

Statement of purpose (1 or 2 sentences)

Experiment description - equipment, setup, procedure, etc. (2 or 3 sentences)

Analysis - how was data analyzed, plotted, etc.? (2 or 3 sentences)

Results - final values with experimental uncertainty (1 or 2 sentences)

Conclusion - successful? consistent within uncertainty? etc. (1 sentence)

Method of instruction and feedback

By providing each student with specific feedback on his or her individual abstract-writing skills, as well as by providing exercises and activities directed toward improved writing (peer review, rewriting, etc.), we seek to ensure that students make measurable progress in abstract writing skills.

Results of Fall 2005, Spring 2006 abstracts

We met as a department on two separate occasions to discuss and analyze this past year's collection of student abstracts, and we have the following observations, indicating some success in meeting our goals, as well as additional challenges pointing to future improvements of our approach to this task.

In the course of the semester, students showed steady progress in the following areas:

- learning to keep within the space and format constraints
- their ability to process and convey results from their experimental work
- their ability to conclude, with supporting evidence, whether or not the experiment was a success in achieving its purpose
- their use of proper grammar and spelling

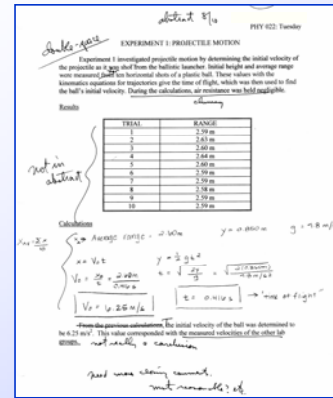
A few areas still needing improvement are

- the precision of their language – many still struggle with scientifically ambiguous descriptions overall time spent crafting and editing the abstract
- their attempt to include more content than necessary, at the expense of concreteness and clarity in avoiding repetition



Students in the general physics laboratory - Fall 2006

General Physics Laboratory - student abstract from early in semester



Same student, abstract from late semester



As a typical example, this student made substantial progress in **format, conciseness and sharpness of language, substance of conclusions**

Future direction for improvements

As a result of our assessment, we plan to

- introduce peer-review: on a few abstracts students will anonymously judge their peers' abstracts and give feedback
- include "group" writes, where the entire class works to craft the "perfect" abstract with lots of interaction between students and with the instructor