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From the Director: Larry Feldman

Not Another Educational Fad!

"If we just wait out this fad, we can get back to normal teaching." This is a common view of how education works. Someone comes up with an idea and it gets "in-serviced" over and over until it dies a slow and agonizing death. A brief period of normalcy follows until a new "fad" comes along and the cycle begins again.

One problem with this point of view is that it does not recognize the contributions of innovations in education. Every one of the "fads" has left behind valuable ideas that have contributed to student learning. Of course, every "fad" has also left some ideas that have generally not been as useful. Unless each teacher gives a sincere effort to incorporate new ideas, (s)he will never know which parts could be adapted into their teaching. Imagine what teaching would be like if we stuck to the content and methods of the 1950s.

I would be very sad if the Quantitative Literacy and Data Driven approaches to teaching math were called "fads". The Quantitative Literacy movement has highlighted how what had been the most feared and despised branch of mathematics (statistics) can be taught in a fun and intuitive way. Probability and statistics can and should be taught to all students. It is rigorous mathematics, it is needed in the world outside of school, and it is fun.

Ten years ago, before the "fad" of Quantitative Literacy had gotten very far, it was not clear that statistics could or should be taught to all. Today, many textbooks have moved it from the forgotten chapter 14 to chapter one. This is an educational movement

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New Stats Workshop Offered

A new workshop targeted at teachers of 11th and 12th grade statistics courses will be offered at Indiana University of PA this summer. Under the direction of Jack Shepler, Professor of Mathematics, the workshop will focus on the statistics content needed to teach a hands-on, activity based statistics course. "It will be aimed at the teacher who teaches or plans to teach a semester course or full year statistics course or an AP Stats Course," stated Shepler.

The workshop will follow the usual SEQuaL format of a pre-session day in May, a week-long intensive workshop from June 24-29, 2001, a follow-up session in the fall, and the final session day in spring of 2002. Participants will receive books, technology, 3 free graduate credits from IUP. The cost of the workshop is funded by a grant from the Eisenhower Professional Development Program through PDE; the only charge to participants will be IUP fees (approximately $45). Anyone interested in receiving more information about the workshop may contact the Center (by phone, 724-357-6239 or by email, jshepler@grove.iup.edu or iwiggins@grove.iup.edu).

Bungie Barbie Competition Proposed

Since its debut at the 1999-2000 Data-Driven Workshop, Bungie Barbie has become a popular activity for integrating real data and linear regression. John Uccellini has proposed a competition for teams of students from schools surrounding the IUP area. The Bungie Barbie activity and discussion of the competition will be the subject of the upcoming Mathematics Academic Alliance for Quantitative Literacy.

The meeting will be held on Tuesday, January 30, 2001, from 3:45 to 5:15 p.m. at the ARIN IU 28 regional office on Rt. 422 west of Indiana . Light refreshments will be served. Teachers from school districts within the ARIN service area must make reservations through their school district. Teachers from private schools or other districts are also welcome. Please make your reservations through Isabella Wiggins at CSEPA, 724-357-6239 or iwiggins@grove.iup.edu.

MAAQL is a collaboration between ARIN IU 28, teachers within the IU, and the IUP Mathematics Department. Meetings are held three times per year. Look for the next MAAQL meeting in March, 2001.

SEQuaL's Website Updated

Have you visited the webpage for SEQuaL lately? The page has been updated and reworked to make it easier to navigate. Besides workshop schedules, the site contains links to some of the past newsletters and pictures from the data-driven workshop at IUP this summer.

We will soon be adding several new items:

- Two interesting activities that Dan Kelly from Northern Cambria High School conducted with his classes: Bungie Barbie & Kamikaze Ken and Capture/Recapture with golf balls

- A bulletin board that will allow you to interact with other teachers with similar interests or post questions for others to discuss. You all have wonderful ideas for new activities or suggestions for improving activities you have tried before.

So start your favorite browser and point it to our site at http://www.ma.iup.edu/projects/SEQual and e-mail either Isabel (iwiggins@grove.iup.edu) or Francisco (falarcon@grove.iup.edu) with your suggestions or comments.

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(not a "fad") that has made significant and permanent improvements to the lives of children.

The Data Driven movement is much newer and much less understood than the Quantitative Literacy movement. Data Driven (DD) is perhaps eight to ten years behind QL. The basic notion that real data can be used to teach all branches of mathematics K-12 is still in its infancy. Years from now, hopefully DD will seem as obvious as QL.

William F. Perry wrote of three main views of knowledge. I am perhaps oversimplifying (there are really nine stages) but his work is very relevant to understanding the "fad" criticism. Perry's lowest phase is called Absolutism where people believe there are authorities that know the "correct" way to do things. Many pre-service teachers and new teachers may fall into this category. They are looking for the "correct" way for each topic to teach all students.

In the middle phase (Relativism) teachers give up looking for the one "correct" way. However, they often become cynical. If there are so many conflicting ways to teach, then it doesn't really matter how you teach. All beliefs are equally good or bad, so a teacher might just decide to go with whatever is in the textbook.

Perry's highest phase is called Relativistic Commitment. In this phase you have developed a belief system about teaching but you are open to learning new approaches. You respect other points of view and you learn from them. Teaching is grounded in deeply held beliefs that are open to change.

It is very difficult for teachers who are not open to Relativistic Commitment to try out new approaches with an open mind. Fortunately, we at SEQuaL have had over 600 teachers who have been willing to try the innovations of QL and DD. Thousands of Pennsylvania K-12 students have benefited from the open mindedness of these teachers. We have a lot to gain from good ~~fads~~ educational innovations. I hope you and your colleagues will come to a SEQuaL workshop and try out some new ideas in your classrooms.

Happy Holidays

Teenagers and Asthma:
A Data-Driven Project

Henry Kranendonk
Rufus King High School
Milwaukee, Wisconsin

During my work with teachers attending the IUP 1999 and 2000 Data-Driven workshops, I attempted to highlight a project developed at Rufus King High School (Milwaukee, Wisconsin) entitled ***Teenagers and Asthma***. This is not an easy project to summarize as it represents a rather comprehensive investigation even when minimally developed. Extensions usually evolved with twists and turns representing important "sidebars" to the planned agenda of the mathematics or statistics units. Yet, I remain an enthusiastic advocate that these sidebars (controlled and monitored by the teacher) can result in teenagers responding more enthusiastically to the important mathematics and statistical topics contained in the project. This reaction was clearly the case for the students at Rufus King High School as we developed this investigation.

It should be stated from the beginning that asthma remains a serious and growing concern for the teenager population in this country. It is a debilitating condition that if not understood can make life miserable for asthmatic students. Researching asthma has the potential to help asthmatic students learn important information to control their primary sources of discomfort. In addition, I observed students identified with the asthmatic condition from this research did not view this identification as a negative (as might be the case with a research involving weight, acne, or some other more sensitive or personal conditions). Asthmatic students seemed encouraged by this research to identify their condition as a way to improve their own environment and the environment of other students. The research developed at our school, however, did not require any student to identify his or her own personal situation.

This project begins with the assignment of defining the condition of asthma. Our school formed a connection with Wisconsin Department of Natural Resources (DNR) and with a local health clinic (The 16th Street Milwaukee Health Clinic). Each of these agencies was able to provide students with an excellent explanation of the asthmatic condition. They also provided state and national data sets, research summaries, authentic websites, breathing equipment, and air quality devices to explain current research studies. This information generated interest and background information for students to form the primary focus of the research – to collect data about the lifestyle and environment of teenagers at our school and to compare this data with asthmatic and non-asthmatic students.

The data collected by the students was generated by a student-developed survey. The formation of the survey involved at least 2 class activities following a review of the DNR and health clinic research summaries. The objective of the first session was to form items for the school survey through a general investigation of lifestyle and environmental queries of selected students. A "talk show" simulation was created to generate the questions. I recruited 8 students to participate as "invited guests" to the talk show. Three of the students selected indicated to me they had asthma and would be comfortable talking about the condition to their classmates. Students from a biology class, a technology class and 3 math classes composed the audience of the talk show. The audience was not aware who had or did not have asthma. The classes represented in the audience resulted from fellow teachers who were interested in following up with activities from the collected data.

Asthmatic students seemed encouraged by this research to identify their condition as a way to improve their own environment and the environment of other students.

Questions from the student audience were first recorded on 3 x 5 cards and submitted to the teachers. Selected questions were presented to a student moderator of the simulation and addressed to the student guests. One of the questions the audience could not ask was whether or not a student had asthma. The goal of the talk show, however, was to ultimately identify the students who had asthma and how the decision was made. Each member of the

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audience was provided a data collection sheet consisting of columns to record specific answers to the questions. Example questions asked by the audience included: "Do you have pets?" "How regularly do you see a doctor?" "Do you have trouble sleeping at night?" "Do members of your family smoke?" The panel discussion lasted approximately 30 minutes. Identification of the asthmatic students was not perfect, however, several of the items selected as "triggers" of an asthmatic condition were viewed as the best indicators. After the simulation, we summarized which items were appropriate or inappropriate for this research. Developing a sensitive and meaningful survey is a challenging task that is especially important in a research of this type.

Five major topics were considered by the students as critical to include in a school survey. The topics the students identified through a group discussion were (1) general demographic information; (2) home environment condition; (3) school environment conditions; (4) family background information; and (5) general health conditions. In addition, specific questions for asthmatic students were included. These latter questions were primarily included to verify some of the important research students learned from the DNR and health clinic. I formed student groups of approximately 3 or 4 students to form survey items for each category. My mathematics class as a whole also addressed general editing and phrasing of the items. The details of forming the items and collating them into one survey took a second class period.

I created several lessons that were presented to the students throughout the semester this project was developed. The scope of the lessons was to continue the data collection process and to reinforce the statistical topics generated from a project of this type. The primary topics presented in the lessons included the following:

(a) Selecting a random sample and deciding if the sample was a "good one";

(b) Organizing the selected surveys into a spreadsheet format for counting and tallying exercises;

(c) Hypothesizing connections of the survey items;

(d) Developing two way tables to investigate the hypothesized statements;

(e) Investigating whether or not the connections indicated an association by analyzing the two-way tables; and

(f) Summarizing the results and the implications.

The above lessons involved another 5 or 6 class periods spread throughout the semester. Our final summary of the project was presented to the school community through a student-directed press conference. Several members from the DNR, the 16th Street Health Clinic and the community at large were involved in listening to the students summarize the data. I am in the process of organizing the lessons outlined above into a printed and on-line format for possible consideration by other teachers. Several of the statistical topics for which the collected data could be summarized are explained and developed in the data-driven module ***"Probability Through Data"***. Reviewers of this module have indicated a special feature of the material is its work with the two-way tables and the topic of association. The asthma project represents a specialized project in which these topics are especially significant. Without much difficulty, extensions introducing a chi-square can easily be incorporated, along with topics of conditional probability, independence and dependence, and further sampling techniques.

One of my career highlights was noted this past summer when I heard John Uccellini and Mark Zilinskas from Indiana High School explain how they took the general idea of this project and expanded it into an incredible school project. John and Mark shared their work with participants at the summer 2000 Data-Driven workshop at IUP. Their work was far more comprehensive than our attempt at Rufus King and included some exciting extensions from several other groups at their school. Interestingly, John and Mark were initially disappointed with the project in that they were not able to complete all the goals they originally set. Clearly they collected an impressive set of data that could be analyzed by their students for several years to come! Hopefully this data set will continue to shape the significance of the work a project of this type generates.

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www.ma.iup.edu/projects/SEQual

Workshop Info - Lessons - Links

We Want to Hear From You

Do you have a great QL activity or project to share? Please send articles, ideas, or comments to the editor:

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I remain completely impressed with IUP and the SEQuaL programs. The encouragement from Jack Shepler, Larry Feldman, Francisco Alarcón, and Isabella Wiggins for the teachers in Pennsylvania is certainly impressive. It was the enthusiasm and excitement generated by these outstanding leaders that has encouraged me to continue to share with each of you these ideas. Please feel free to e-mail me further questions or comments about the asthma project or any of the Data-Driven materials. I will continue to keep the IUP program updated on the progress of writing this material for a further expansion of the data-driven modules and goals.

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(Footnote; another project is currently being developed that is also of interest to some of the IUP participants. I will try to summarize this project **"Generations: Teenagers Now and Then"** for a future newsletter.)

Pennsylvania Statistical Poster Competition

Make a New Year's resolution to send student posters to the 2001 PA Statistical Poster Competiton!

A statistics poster is a display containing two or more related graphics that summarize data, provide different points of view, and answer a question about the data. There are categories for all grade levels K-12. Entries are automatically submitted to the national Statsitics Poster Competion sponsored by the American Statistical Association.

The deadline for submission of posters is February 28, 2001. To find out more about eligibility and rules look on Tom Short's webpage at **renoir.vill.edu/~short/posters/**.

Judging will take place at the March Pennsylvania Council of Teachers of Mathematics meeting in Pittsburgh. Prize winners for the Pennsylvania Competition will be announced by March 31, 2001.

For more info contact:

Tom Short
Phone: (610) 519-6961
Fax: (610) 519-6928
E-mail: thomas.short@villanova.edu

News from SEQuaL Friends

James F. Bohan, site director of the Manheim SEQuaL and Math Coordinator at Manheim Township School District, has published AP Statistics: Preparing for the Advanced Placement Examination (AMCSO Publications).

Glen Butters, Gary Merrick, and Bill Wolfe, Troy Middle School, have had two lessons accepted for inclusion in a video project of the Pennsylvania Public Television Network.

Varnelle Moore, 98-99 Villanova SEQuaL, has a geometry page for grades K-2 at http://mathforum.com/varnelle/

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This newsletter is published through the Center for Statistics Education in PA at IUP. **Director:** Larry Feldman; **Assistant Director:** Francisco Alarcón; **Program Coordinator:** Isabella Wiggins; **Senior Consultant:** Jack Shepler; **Site Directors:** James Bohan, Elaine Carbone, Patricia Flach, Fred Morgan, Jean Werner; **University Teaching Faculty:** Barbara Lamberski, Ann Massey, Glenn Rock, Allan Rossman, Bernie Schroeder, Tom Short; **K-12 Teaching Faculty:** Brenda Ashanti, John Aufman, James Bogaczyk, Linda Brecht, Lorrie Bucklen, Glen Butters, John Costango, Marlene Davis, Renetta Deremer, Charles Fleming, Arlene Gaudioso, Phyllis Howard, Wes Hunkler, Barbara Kaufman, Holly Lecce, Peggy Lunardini, Jill Mackey, Michael McBride, Rita McMinn, Gary Merrick, Mary Lou Metz, Joseph Monteleone, Beth Palilla, James Preston, Anita Smith, Carol Tanweer, Jennifer Traynor, John Uccellini, Mark Zilinskas.

UPCOMING DATES . . .

2001

JANUARY 30	MATHEMATICS ACADEMIC ALLIANCE ARIN IU 28 3:45 - 5:15 "FORMING A BUNGIE BARBIE COMPETITION"
FEBRUARY 28	PA STATISTISCS POSTER COMPETITON DEADLINE renoir.vill.edu/~short/posters/
MARCH 15-17	PCTM AT PITTSBURGH SEQUAL SHORT COURSES SECONDARY - SATURDAY A.M. ELEMENTARY - SATURDAY P.M. **TELL YOUR COLLEAGUES
MARCH 23	HAZLETON SEQUAL FINAL SESSION
MARCH 24	MANHEIM SEQUAL FINAL SESSION
MARCH 31	IUP DATA-DRIVEN FINAL SESSION
APRIL 28	EDINBORO SEQUAL FINAL SESSION