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Pennsylvania Educational Leadership

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Co-Editors

Denise G. Meister
Penn State – Harrisburg

Judith L. Zaenglein
Penn State – Harrisburg

Editor Emeritus

Robert F. Nicely, Jr.

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Educators impacting teaching and learning through leadership.

Pennsylvania Educational Leadership

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Foreword

The articles in this issue of *Pennsylvania Education Leadership* promote the stated mission of the organization which is **Educators impacting teaching and learning through leadership.** Specifically, this issue focuses on current and relevant issues facing educators today: teaching and assessing for "real learning" in the classroom, supporting the growth and development of both new teachers and veterans, and meeting the unique needs of all students.

In the lead article *Katrina Brown, Todd Brown and Vickilyn Barnot* share their experiences in moving from a traditional physics classroom to one more focused on inquiry-based activities. They provide samples of their instructional materials as well as a discussion of the benefits of this approach for both students and instructors.

Matthew Meakin argues for an increased focus on authentic assessment in the classroom. He presents his arguments from the utilitarian perspective and provides a context for authentic assessments within the overall assessment structure.

In the third article, by *Kathleen Blouch and Michael Benner,* the focus shifts to teacher support. The authors describe their efforts to develop a science teacher observation protocol that assists in providing feedback on the use of inquiry-based strategies in the science classroom. Their blended instrument draws from the Danielson Framework as well as the Reformed Teaching Observation Protocol.

The fourth article also addresses the provision of support for teachers, especially those new to the classroom. *Greg Tartanto and Sylvia Braidic* used technology within a K-12 and higher education partnership to create a dynamic learning community for beginning teachers. Through Web 2.0 and wikis teachers had an opportunity to share their experiences and provide suggestions to one another.

The final article, by *Jessical Hosley and Nathaniel Hosley*, addresses issues related to the development and delivery of alternative education programs. The authors examine teacher and administrator perceptions of curricular issues through academic, behavioral, and therapeutic lenses.

We hope that you find the articles to be stimulating reading. Feel free to contact the authors about their work and ideas. If you have an idea for an article, please submit it for consideration.

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Inquiry-Based Experiments for Introductory Physics Labs: Instructor and Student Perceived Benefits and Outcomes

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In the 1960s and 1970s there was a major effort to implement inquiry-based science teaching in the physics laboratory, but in many schools this type of pedagogy was not consistently implemented and slowly disappeared (Lopez and Schultz, 2001). In fact, many schools still implement the traditional "cookbook" laboratories in their science classes. In a traditional cookbook experiment, there are specific step-by-step directions with little variability in methods or outcomes. Little is left to chance and students are not encouraged to think critically about the outcomes or procedures, and they are not motivated to think at a higher level.

In 1965, T. Zaleskiewicz, Professor of Physics at the University of Pittsburgh at Greensburg, developed an inquiry-based physics laboratory to accompany an introductory physics course. The inquiry-based format of the experiments has been used since then and has created a challenging scientific experience for the students. These experiments are designed to encourage students to explore the scientific method and the nature of science. Through inquiry the students will learn about manipulation of variables and controls and the techniques of experimental design.

Physics education research has shown that after students learn through collaborative inquiry they are more inclined to organize their reasoning through the use of hypotheses and have a better understanding of the role of experimentation in testing those hypotheses (Roseberry et al., 1992). Bybee (2003) argues that pedagogical techniques rooted in inquiry will deepen student understanding and impart a deeper appreciation of science. As pointed out by Rutherford (1964), laboratory experiences need to actively engage students in the process of scientific inquiry so that they can gain first-hand experience as to how inquiry actually occurs in the sciences.

Many inquiry-based activities require more classroom time than their cookbook counterparts; thus, there has been concern and disagreement over whether inquiry-based science lessons result in an overall decrease in the amount of content that is learned. However, Shymansky et al. (1990) point out that there have been many studies indicating that the use of inquiry-based exercises and a concentration on conceptual learning does not lower student scores on quantitative exercises and can improve student performance in the sciences. Additionally, recent comparisons have been made between Chinese students, who have a strong background of factual learning in physics, to U.S. students, who have a more limited background. The comparison showed that an emphasis on learning physics facts does not strengthen a student's ability to understand scientific reasoning (Bao et al, 2009). Thus, evidence suggests that teaching students more concepts and facts will not improve their critical thinking and reasoning skills.

Inquiry-based tasks help students develop scientific reasoning and critical thinking skills, and it is these same skills that we want students to sharpen in our introductory physics laboratory courses. In the experiments discussed here, students work in groups of three and complete six experiments during the semester. Each student must write his own laboratory report for each of these experiments. Students are given deadlines for the first several laboratory reports, but the schedule for the later laboratory reports is flexible so the student groups are responsible for determining their own timetables and managing their in-laboratory time. The goal of the laboratory course is to challenge students to use their problem-solving skills, instill in them a firm understanding of uncertainties and errors in measurements, and train them to write superior laboratory reports. The methodology used in these inquiry-based laboratories simulates experiences that they are more likely to encounter in the workplace.

The Experiments

An initial set of laboratory exercises were developed at our institution and have been augmented by the co-authors. The laboratories are arranged in a rotating schedule of experiments so that students in consecutive years will perform different experiments.

An example of the instructional handout for one of the experiments is shown in Figure 1. This handout is distributed for the Air Track Determination of 'g' experiment. In this experiment students use an air track (which simulates a frictionless environment) to determine the acceleration due to gravity.

Figure 1. The handout that is distributed to students for the experimental determination of the acceleration due to gravity, using an air track.

Track Determination of 'g'

Equipment

Air track and blower, air track cars, meter stick(s), Vernier calipers, stop watches, riser blocks, balance

Procedure

1. Adjust the air track so it is flat and level.
2. Place riser block/blocks under one end of the track and measure times (t) for a car to cover selected distances (s).
3. Plot s *vs* t^2 and calculate 'g' from the slope of the 'best' line among the points.
4. Repeat the above steps for different cars and blocks until you can demonstrate that 'g' is independent of
    a) the mass of the car
    b) the incline of the track.

The students are intentionally given skeletal instructions for the experiment, and they must make decisions about the details independently. For this particular experiment these decisions require determining where to start the car, where to stop the car, how to synchronize the start of the car with the timers, how many runs to make for each distance, how many different distances to examine, how many different elevation angles of the track to examine and how many different cars to examine. The students must also determine what measurements to make, such as mass of the cars, distances between supports of the air track, and heights of the risers, and they must determine the uncertainty in all of these measurements. While this would be trivial for those of us who have taught numerous laboratories, making these decisions and setting up this experiment is not a trivial experience for the students.

The handout also does not explain to students the sequence of equations they will need to use to find 'g'. They have to develop the theory and, using the guidelines from the handout, determine how to find 'g'. If students do not prepare before the laboratory meets, they are usually incapable of figuring out how to get 'g' from their measurements. For example, the handout guides the student to plot s *vs* t^2 and calculate 'g' from the slope of the line. If students come unprepared, they will make this plot and assume that the slope *is* 'g'. It is then the instructor's job to direct the students to the appropriate kinematics equations and ask them to show why they are plotting s *vs* t^2 and allow them to determine for themselves, independently, that the slope is $(g\sin\varphi)/2$, where φ is the angle of air track elevation.

The students are also required to submit individual laboratory reports for each laboratory exercise. They are expected to derive any equations that they use in the theory section, write a detailed experimental section, show raw data and sample calculations, and write results, discussion and error analysis sections. They are to show appropriate use of absolute error and percent error and carry these errors through their calculations. They must draw their graphs by hand, including error bars, and determine their best-fit lines by hand. Since this is the introductory laboratory course for these students, the derivations that they do in their written reports are often the first derivations they have ever completed; thus, it is important to assign laboratory exercises for which the theory is not overwhelmingly difficult.

Although we feel that simpler experiments are well suited to this type of format, that does not mean the experiments need to be trivial. For instance, one of the laboratory exercises we use involves determining 'g' from a simple pendulum. The equipment necessary is minimal and very inexpensive. The handout for this experiment is shown in Figure 2.

Figure 2. The handout that is distributed to students for the experimental determination of 'g' using a simple pendulum. The students are required to take measurements such that their error flags are a pre-determined size.

Simple Pendulum
(Uncertainty Analysis Lab)

Equipment

Table clamp, rod, string, Vernier calipers, pendulum clamp, stop watch, light and heavy pendulum bobs, protractor, meter stick

Procedure

1. Construct pendulum of length L with light bob.
2. Place pendulum in small amplitude oscillation (less than 15°).
3. Measure time (t) for N oscillations and calculate the period (T) .
4. Repeat for 4 or 5 different lengths.
5. Plot L vs T^2 and determine the acceleration due to gravity (g) from the slope

NOTE: on your graph you will be required to have the 'error flags' on L and T^2 represent the same % of uncertainty. Therefore select N such that:
(%error in T) = ½ (%error in L)

6. Repeat above for heavy bob.
7. Compare 'g' values.

In order to graph as instructed, students must have a good understanding of error analysis. This requires a substantial amount of planning on their part before taking data. Additionally, most students find the theory for the written report very demanding since they are expected to derive the equation for the period of a pendulum using the theory of simple harmonic motion. So although this could be a simple experiment the inquiry-based nature of the experiment makes it quite challenging and equally engaging.

Outcomes of Inquiry-based Laboratory

The inquiry-based experiments in this laboratory course are intended to familiarize the students with the inquiry process critical to learning and performing in the sciences. These experiments leave many experimental decisions in the hands of the students. For almost all of the students this is a unique experience and they find it rather difficult. During the first laboratory session, the instructor is bombarded with questions, such as ‘How many runs should we do?’ and ‘How do I find ‘g’ from the graph?’ Many of the students are very unsure about their own judgment when it comes to performing the experiments. Since the laboratory course is designed specifically so that they will make these decisions on their own, it is crucially important that the instructor does not give detailed step-by-step instructions. As instructors, we have found it to be challenging to gently nudge the students in the right direction without giving them too little or too much help. We usually accomplish this by answering their questions with questions that are intended to be thought provoking. For instance, students frequently ask the instructor how many trials they should perform when collecting data. We counter to the students by asking them how many pop quizzes would they want their physics grade to be based upon.

If the students proceed in the wrong direction in their data taking or analysis, the instructors have to avoid the urge to simply correct them. Instead, we have found it best to probe the students by having them explain what they are doing. In most cases, as they try to explain what they are doing, they realize their error. The students become much more comfortable with the inquiry-based approach as the semester progresses.

Student Perceptions

It should be noted that the students in our course are upperclassmen and will already have had several biology and chemistry laboratories that employ step-by-step experiments. All of the physics laboratories offered at our institution are inquiry-based so that they do not have the option to enroll in a cookbook lab. We introduce the students to the reasoning behind our use of inquiry exercises on the first day of class.

We feel that the inquiry-based experiments are far more beneficial to the students than a typical cookbook physics laboratory exercises. However, this method of instruction is foreign to most students, and they will frequently lament about the lack of a manual to follow. For example, a typical negative response by a student on the end-of-term student’s opinion of teaching survey was: “We were left on our own to figure things out.” On the other hand, most students will say in the positive comment section that the laboratory course has improved their writing and research skills. Frequently, the same students who make negative comments similar to that quoted above will also make a positive comment about improving their research skills.

It has been shown that most students entering an introductory undergraduate physics course do not have the same expectations as the instructor (Redish et al., 1998 and 1999). As those authors described, most students at this level have characteristics of binary learners, expecting to be told the correct answer without having to develop ideas on their own. While this makes a traditional physics class difficult, it will make an inquiry-based laboratory even more complicated for both the students and instructors. The students' frequent requests for a manual, which will tell them exactly what to do, indicate that many are still learning in this type of binary mode. Some students will have difficulty adjusting to an inquiry-based laboratory course.

For this reason, our student evaluations of teaching in this inquiry-based laboratory course are often lower than they have been in physics laboratory courses we have previously taught using step-by-step manuals. We therefore developed an end-of-class survey that asks the students to rank how much they have learned, as well as how hard they have worked, in this physics laboratory course compared to other laboratory courses they have taken at our institution.

Unfortunately, since this is the only physics laboratory they will take at our institution, the students are unable to make direct comparisons between this inquiry physics laboratory and a cookbook physics laboratory. Thus their responses draw upon their comparisons of this physics laboratory to biology and chemistry laboratories they have taken. In our survey we ask them questions such as: "Compared to other labs taken, how much do you think this physics lab has challenged your problem solving skill?" and "Compared to other labs taken, how much do you think this physics lab has emphasized the analysis of possible errors?" They are asked to respond by circling a number on a 1 to 5 scale where 1 is "significantly less" and 5 is "significantly more."

Over 80% of the 69 students polled (four sections of the class over a two-year period) believe that this inquiry-based laboratory course was more, or significantly more, challenging than a standard laboratory course at our school. It should be noted that this is despite the fact that the experiments themselves are very basic and there are fewer of them. Over 80% of students also felt that this course challenged their problem-solving skills and had very positively affected their research skills.

As mentioned above, the students were asked to consider how much error analysis was emphasized in this course compared to other laboratory courses. Approximately 90% of respondents felt that the lab emphasized error analysis more, or significantly more, than other labs they have taken. They were also asked, "How has the physics lab affected your ability to estimate errors and perform error analysis?" Approximately 95% of students responded that this laboratory course improved, or significantly improved, their ability to estimate errors and perform error analysis. The students' responses to the former question indicate that they recognize we are trying to strengthen their ability to analyze the validity of their results. Their responses to the latter question indicate that they believe we have succeeded. Their responses reflect the idea that the inquiry-based approach helped them to think like scientists more so than an ordinary cookbook laboratory course by emphasizing things, such as error analysis and problem solving skills.

When we individually ask the students how much they believe they have learned in this course compared to laboratory courses where they are given manuals, they will usually say that they have worked harder and learned more in the inquiry-based laboratory course. One student wrote the following about this course:

> At first I was taken back (sic) by not having a manual to follow with everything laid out for me. I thought about the amount of work that not having a manual would entail and got a little worried. After completing the first assignment, it did get easier. The handouts that

> were provided gave me enough direction to complete the required assignments and I think took the place of the "manual." By not having a manual, I was required to take time to look up information, design my own unique experiment, and then test it out and solve any problems that arose with guidance from the instructor. I think I actually learned more by having to do this. Not only did I learn about ideas, I had to apply that knowledge and solve problems.

This type of response is typical of the students who work hard in the course. These students have started to move from the binary type of learning to one that entails development of their own ideas. Upon review of the written lab reports throughout the semester, a progressive growth in critical thinking skills and scientific reasoning is evident amongst the students.

Instructor Perceptions

Leaving a number of experimental details to be determined by the students means that many laboratory exercises will take a longer time period than they would if the students were given step-by-step instructions. For instance, data collection for the simple pendulum will take students a four-hour lab period, whereas in laboratory exercises we have taught using a cookbook manual it is typically performed in less than one, two-hour period. While fewer experiments can be conducted, the students have a deeper understanding of the material that is covered.

We also recommend that this type of instruction works best with experiments that don't require a great deal of equipment and setup. Each additional piece of apparatus used introduces new variables that the student will have to contend with. Therefore, to keep the laboratory exercises feasible for this introductory level of students, we have found it best that the setups are not too complicated. Inquiry-based experiments that are more complicated and require more computer interfacing would probably be ideal for more advanced students.

Students will have to work out the theory and calculations independently to determine if they are conducting a good experiment. For instance, when performing the air track experiment mentioned above, the students will have to graph their data and calculate 'g'. If the angle of inclination of the air track is too large, they will not obtain good values for 'g' since the times will be short and have large errors. For this reason, it often occurs that, upon finishing data collection and calculating 'g', the students will find their values are unacceptably high or low. They must then determine why their values are off and decide if they want to submit those values or retake the data. The students realize that submitting values that are too high or too low will affect their grade, but they also realize how much time it will require to retake their data. This frequently leads to heated discussions among group members as to how much time a good grade is worth.

For the instructors, guiding students without holding their hands can be demanding and stimulating. The inquiry-based design of this lab has emphasized the importance of wait time (Rowe, 1974). Frequently when a student asks a question, the implementation by the instructor of the appropriate amount of wait time before giving a response allows one of the students' laboratory partners to answer the question. It also frequently happens that the student will rephrase the question and in doing so is able to begin to decipher the answer for himself. It is a rewarding challenge for the instructors to lead a conversation with the student that will allow the student to uncover his/her own answer.

Practical Considerations of Design

Although at first glance it seems it would be trivial to transfer an experiment described in a cookbook based laboratory manual into an experiment suitable for the inquiry laboratory by simply shortening the procedure, it can be quite thought provoking. For example, one author (T. Brown) previously used a cookbook handout such as the one shown in Figure 3 for an experiment with a fan cart (a cart propelled by a fan such that it moves along a level linear track). The fan can be rotated so that it blows at any angle relative to the direction of the cart's motion. The experiment is used to explore Newton's second law. Figure 3 shows the procedure part of the handout, but there is also a similar handout for the analysis of the data (not included here for the sake of brevity).

A conversion of this into an inquiry-based experiment is shown in Figure 4. As can be seen by comparing Figures 3 and 4, in the inquiry-based course students are expected to determine their own method for finding an accepted value of F_{fan}. They are not explicitly told how many times to repeat their measurements or what distance the fan cart should cover. They must decide for themselves how many angles to test. They must also develop the theory that will enable them to find F_{fan} and $f_{friction}$ from the graph. It is also entirely dependent upon the students to determine the parameters for demonstrating the effects of the mass of the cart on the net and frictional forces.

Figure 3. Instructions distributed to students for a traditional laboratory experiment that is used to explore Newton's second law.

Force Supplied By A Fan Cart

Equipment

Masses, Tape, Fan cart, Fan cart track, Triple beam balance, Stop watch, Meter stick.

Procedure

Obtain the mass of the cart as well as the "expected" value for F_{fan}. This is done by using the digital scales.

1. Turn on the scales and make sure they are zeroed.
2. Place the fan cart onto the center of scale. Be sure it is placed in such a way that you can turn on the blades and the force will push the cart DIRECTLY down onto the scales. Record the mass (convert to kilograms) in Data Table #1.
3. Turn the fan on. Record this new mass in Data Table #1.
4. The expected value for F_{fan} is the acceleration due to gravity (g=9.80 m/sec^2) multiplied by the mass. You can do this simple calculation and enter it into Data Table #1 since it is the value we should get from our graph at the end.

Data Table #1

m_1= Fan Cart Mass (not on) in kg	
m_2= Fan Cart Mass (blades on, pushing downward) in kg	
F_{fan} = $(m_2 - m_1)$*g (in Newtons)	

5. Return to the track and make sure that it is level.
6. Place the fan cart near one end and have one person (The Starter) determine a convenient place that they can start the cart. Be sure that you always place the cart here and it is the same part of the cart (e.g. middle of the front wheel). You are going to be doing this almost 10 times so be sure you keep track of this starting point.
7. Another person (The Stopper) stops the cart at the same point each time This person has to be careful not to let the fan do any damage to anyone and not go flying off the track. The Stopper must be sure NOT to stop the cart BEFORE it hits the Finish Line under its own power.

To help insure the cart comes to a stop at the same place each time, use a buffer (a book, for example) propped against the edge of the track.

8. Knowing the start and stop point stays the same, calculate the distance the cart travels (x) for each run. Enter this value in Data Table #2 (It will fill up the entire 2nd column with the same value provided the Cart Stopper and Cart Starter do their job)
9. You are now ready for the time trials. Set the angle that the fan is oriented to 30˚. Set the speed setting to Low (as it should have been when you weighed the cart with the moving fan earlier). Have two people be timers. Their goal: to measure the time it takes for the cart to move the distance 'x'. Agree on some common lingo to make sure the watches start when the Cart-Starter releases the cart (3,2,1, GO! With the cart being released and the watches started on 'Go!').
10. If both timers get similar times, then the run looks successful, enter the times each got into Table #2 and take the average time. Otherwise, if drastically different times, repeat the run.
11. Repeat this for each angle indicated in Data Table #2

Data Table #2: Times for running the cart at the low speed for the angles indicated

θ	x (m)	Time1 (s)	Time2 (s)	$Time_{Ave}$ (Time1+Time2)/2
30˚				
40˚				
50˚				
60˚				
65˚				
70˚				
75˚				
80˚				
85˚				

As can be seen by the example in Figure 4, the experiments must have instructions that are sufficient to guide the students through the laboratory exercise as well as subtly prompt them towards the theory they will need. However, the instructions should not be so vague that they send the students down fruitless paths or leave them not understanding how to set up the experiments. Paring down the instructions for an experiment written for a typical introductory physics laboratory requires many test runs to ensure that critical steps are not left out of the instructions and that the instructions are still open-ended enough to require the students to develop their own procedures. We have found it best if the instructions give a good indication of how to set up the equipment for the experiment, but leave the details of how to collect data and develop the theory to the students.

Figure 4. Inquiry-based instructions distributed to students for the same experiment described in Figure 3.

Force Supplied By A Fan Cart

Equipment

Masses, Tape, Fan cart, Fan cart track, Triple beam balance, Stop watch, Meter stick

Procedure

1. Measure an accepted value for the force of the fan (F_{fan}).
2. Measure the time (t) for the fan cart to travel a given distance (x).
3. Use your values for t and x to determine $F_{net\ on\ cart.}$
4. Repeat steps 2-3 for various angles (ϕ) where ϕ is the angle relative to the direction of motion.
5. Plot $F_{net\ on\ cart}$ vs $cos\phi$.
6. Determine F_{fan} and $f_{friction}$ from the graph.
7. Repeat steps 2-6 for different masses of the fan cart until you demonstrate the effect of the mass on the net force and frictional force.

In our course there is also a great deal of emphasis on the preparation of written laboratory reports. The paring down of the procedures they are given requires that the students develop significant portions of their experimental technique, which inherently makes the procedural section of their written reports more thought provoking. Students' responses to the final survey indicate that the laboratory reports in this course were significantly more challenging than standard laboratory reports done in cookbook laboratories. From our experiences with working with the students throughout the course, we feel this is clearly because of the requirement that they develop their own theory and procedure sections and deal with absolute errors and percent errors in their calculations. Once again, it should be noted that these are very basic experiments that do not have difficult theories or calculations. These experiments and laboratory reports have challenged the students by using the inquiry-based approach.

Conclusions

In developing and using the inquiry-based laboratory we have found the most success with experiments that have instructions which give a general idea of how to set up the experiment, but leave the details of the equipment assembly and data collection to the students. In addition, the experiments should require the students to develop the theory and determine how to analyze the success of their experiments on their own.

This type of instruction works well with experiments that don't require a great deal of equipment. The skeletal instructions mean that many laboratory exercises will take a longer, but more enriching, period of time than they would if the students were given step-by-step instructions. Most of the students recognize that they learn more about scientific research skills and critical thinking in this laboratory course than they do in non-inquiry-based laboratory courses, but they still lament the lack of a detailed manual. Considering the significant amount of research on science instruction that indicates that inquiry-based laboratories are more successful at teaching the nature of science, we consider this laboratory to be beneficial in helping our students think like scientists.

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For The Greater Good: The Utilitarian Case for Increased Focus on Authentic Assessment

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Over the past decade, students have been increasingly exposed to standardized testing. Many of these tests are predominantly multiple-choice in nature. In the very near future, Pennsylvania students will likely be required to pass a number of content-specific standardized tests called Keystone Exams, or a state-approved, local alternative assessment, in order to graduate high school (Pennsylvania Department of Education, 2010b). Proficiency on these tests is accepted as indication that a student has met required learning standards and is, therefore, well-placed to function adequately in a technological world where reading and math skills are essential for successful immersion into a competitive global market (PDE, 2010a). Some educators disagree with this position. The opposing view is that traditional, multiple-choice standardized testing does not engage students in authentic learning characterized by the intrinsic motivation to seek understanding of the learning process and solutions to real problems (Segers, Gijbels, Thurlings, 2008; & Garrison, 2007). This camp forwards the incorporation of authentic types of standards-based assessment into more practical assessments of student learning (Lalley & Gentile, 2009; McTighe & O'Connor, 2005; Scriffiny, 2008; Winger, 2009). They believe that assessment effectiveness at a state and classroom level is maximized when assessments are used to capture the value of learning in real-world situations. This type of authentic assessment is generally formative in nature and serves as record of the student's learning process.

Both groups produce ample data to justify the value of both standardized and authentic assessment. The merits of formative and summative assessments are argued ad nauseum. What is not discussed is an ethical basis for the preference of one form of assessment over another. In this article I will argue that authentic assessment of student learning has greater utility than traditional, standardized assessment methods due to the extent to which it benefits the individual and society as a whole.

To identify the ethical base for this argument, it is necessary for us to consider the work of the 18th century Classical Utilitarians, Jeremy Bentham and John Stuart Mill.

Classical Utilitarianism – The Fundamentals

Jeremy Bentham is identified as the father figure of Classical Utilitarianism. The genesis of Classical Utilitarianism is found in the rash of laws generated as a response to the Industrial Revolution in 19th century England. Industrialization brought great social changes and governments responded by constructing many new laws. It became evident that while these laws were soundly developed in the theoretical objectivism of innate concepts, the majority were impractical and unjust. They were, in essence, laws for the sake of having laws. Their primary purpose was to protect the interests of the elite while penalizing the fledgling industrial class and repressing those in penury. Bentham and like-minded thinkers, such as John Stuart Mill, became displeased with laws in which they could see no utility and sought to deliberately improve societal conditions for all through legislation and education (Gutek, 2004).

For Utilitarians, each action or law can be measured by the amount of happiness it generates and to the degree that it shields from unhappiness. Utilitarians described this principal as the “utility” of an action. Bentham proposed a quantitative system for the measurement of utility. In Bentham’s system any action became quantifiable through its outcome. Substantively, the utility of differing consequences could be weighed directly against each other. Bentham stated that if a law or an action doesn’t do any good, then it isn’t any good. A law or action can have excellent theoretical background based on moral law, but if it isn’t practical then it is worthless. Bentham delineated the properties and usage of his “moral calculator” in *Introduction to the Principles and Morals of Legislation (1781).* Bentham used variables to create a formula for pleasure: intensity (how strong the pleasure or pain is), duration (how long it lasts), certainty (how likely the pleasure or pain is to be the result of the action), proximity (how close the sensation will be to performance of the action), fecundity (how likely it is to lead to further pleasures or pains), and purity (how much intermixture there is with the other sensation). One also considers extent — the number of people affected by the action. This concept of utility has been institutionalized in the familiar saying that the utility of action is maximized when the action brings the greatest amount of good to the greatest amount of people (Gutek, 2004; Driver, 2009).

John Stuart Mill developed Bentham’s ideas by adding a qualitative aspect to his equation (Heydt, 2006; Driver, 2009). He extended Bentham’s concern for the individual and civil liberty into a viable tool for social, political, educational, and economic reform (Driver, 2009). Mill became an advocate for the minority groups in society and forwarded such radical proposals as women’s right and suffrage and education for all. Indeed, Mill believed that society could not reach its full potential if each individual within the society had not the opportunity to reach the peak of his/her own potential. If the extent of change did not reach the societal level then the change did not have maximum utility. The only way to reach this actualization was through equal access to education for all (Heydt, 2006).

Utilitarianism’s Impact on Social Reconstructionist Ideals

Classical Utilitarianism contributed greatly to the Progressive movement in early 20th century America by proving a foundation for using peaceful and gradual means to solve problems in society by enacting laws to regulate the economy while preserving the capitalistic free-market system and representative democracy (Gutek, 180-81). Utilitarian ideals, such as society needing rationally directed and scientific reform, reforms aimed at engendering the greatest amount of good for the greatest number of people, decisions based on ultimate utility, and the preservation of natural human rights and democratic responsibilities embedded in the early Progressive movement (Gutek, 2004). The Pragmatist philosopher, John Dewey, sought to improve society through a public process not through a quantum leap to a utopian society (Gutek, 2004; Stern & Riley, 2001). So as the Classical Utilitarians had promoted the quantification of the usefulness of action through a scientifically designed process, so too did Dewey forward a set process for selecting the best available action. An emphasis on the scientific method, active learning, and a child-first approach were the hallmarks of his belief (Gutek, 2004; Stern & Riley, 2001). This approach was called Child-Centered Progressivism. It is from this base that the Social Reconstructionists splinter.

Social Reconstructionists, such as George S. Counts, Harold Rugg, and Theodore Brameld, united with Child-Centered Progressives in their opposition to the authoritarianism and formalism of the public school. They, too, saw education as the key to finding the solutions to the problems inherent in early 20th century society (Stern & Riley, 2001). However, Social Reconstructionists felt that education was a politically charged arena and schools and teachers should become deliberate agents of social, political, and economic reform. As Thomas (1999) explains the Reconstructionist approach, “The public schools were important vehicles for extending democracy into all dimensions of society. They advocated for a curriculum that promoted specific economic and social reforms that were defensible because they were democratic in design" (p. 262). In this aspect, they held a more aggressive reform approach than Dewey and the Child-Centered Progressivists. They forwarded moving past student-based searches for knowledge and immediately beginning a more forceful mode of education based on the fundamentals of insisted participation in the democratic process. Social Reconstructionism contained the premise that learning should be authentic. Instructors facilitated learning in a living curriculum with the belief that students could provide meaningful answers to real-world problems. Here lies the direct link to the Classical Utilitarians. The Social Reconstructionists are the first group to clearly articulate that learning cannot be solely for the point of learning; just as the Utilitarians had stated that laws or actions could not be solely for the purpose of a law or action. The utility of the action is measured by the extent to which it reaches. Learning subject matter in the sterile classroom environment is arguably a good action within itself, but it has limited extent. Using subject matter to find solutions to real world problems brings an extent that goes beyond the student and the classroom. One supposes that the value of authentic curriculum and learning would be mirrored in authentic assessment practices. This approach is oppositional to today's emphasis on accountability-based assessments common at both state and local classroom level.

The Assessment Debate: Examining Relevancy Through Utility and Extent

The modern assessment debate centers on the utility of formative and summative assessments (Frey & Schmitt, 2007; McTighe & O'Connor, 2005). Formative assessment is a collection of informal and formal data from sources such as observations, conversations, performance assignments and benchmark assessments such as quizzes that provide ongoing data to both the teacher and student regarding student learning. Data received from formative assessment are used to differentiate classroom instruction. Formative assessment is assessment for learning not of learning. Summative assessments occur at key parts of the student's academic journey and are often high-stakes tests, which become part of the student's permanent record. These summative assessments can be norm-referenced or criterion-referenced and often take the form of traditional multiple-choice, fact-based examinations. Summative assessments occur after all pertinent curricula have been taught. In-class summative assessments are chapter, unit, mid-term, or final exams. Other traditional forms of summative assessment include state tests such as the PSSA and upcoming Keystone exams. The results of these tests are used to mark a schools adequate yearly progress in compliance with No Child Left Behind (PDE, 2010a; PDE, 2010b). When these definitions of formative and summative assessment are considered, both types of assessment appear useful. Formative assessment is utilized along the learning path in conjunction with summative assessment, which is used to describe the student's accomplishments at a particular learning terminal (Marzano & Pickering, 2010).

As Social Reconstructionists believed that the purpose of education was to provide solutions to critical social issues, they would desire assessment relevant to such problems. Social Reconstructionists would argue that it is the nature of the assessment, not its form (summative or formative), that indicates its utility. The utility of assessment would be measured by the authenticity of the assessment task. In other words, how does this assessment relate to the solving of real-world problems? Frey and Schmitt (2007) describe authentic assessment as any assessment that specifically addresses real-world applications. Authentic assessments include performance, portfolio, and product. The difference between traditional and authentic assessment can be highlighted using the following examples. After receiving a lecture on the correct use of a Bunsen burner, a teacher gives a traditional assessment in which students complete a diagram of the Bunsen burner by describing each part of the apparatus. In contrast, another teacher uses an authentic, performance-based assessment in which each student correctly sets up the Bunsen burner apparatus. Further, instead of receiving a grade based on the cumulative grades of a series of critical literature analyses written through a course, a student receives a grade based on the extent to which a final portfolio, revised as many times as needed throughout the course, meets pre-established course standards, including opinion pieces, problem solving articles, and contemporary issues collected from different curricula areas. Lastly, working in groups, students investigate a problem in the community or school and develop possible solutions, which are presented to the town council or school board. A solution is chosen and a product manufactured. For example, the run-down nature trail is salvaged and maintained as a class project. Wiggins (1993) argues that traditional assessment is not inauthentic but is just less meaningful to students. Social Reconstructionists would disagree. Unless the assessment, be it formative or summative, is not directly linked to authentic real-world problems, they would view it as useless because it serves no purpose other than to assess student learning in the vacuum of the academic arena. For Social Reconstructionists, all instruction, curriculum, and assessment occurring in the classroom must be directly related to the solving of real world problems. This can be achieved through summative or formative assessment but it must be authentic.

Not only are authentic assessments more useful than traditional assessments because of their application to real world problems, but also they are further justified by the extent of their utility. In *An Introduction to the Principles of Morals and Legislation* (1781), Jeremy Bentham defined extent as "the number of persons to whom it (pleasure or pain caused by an action) extends; or…who are affected by it." (Chapter 4) Traditional assessments, particularly summative fact-based assessments using recall-centered methods such as short response and multiple-choice questions, have a very limited extent. Traditional assessments give information on student performance to the teacher and student. Once this information is presented to both parties, the teacher and student move on to the next piece of curriculum. Students are not challenged to participate in deep approaches to learning characterized by the intrinsic motivation to seek meaning and understanding of the learning process (Segers, Gijbels, Thurlings, 2008; & Garrison, 2008). Zhao (2009) argues that an emphasis on high-stakes standardized testing does not prepare students as self-directed learners. The skill of self-direction is far more important than competency in specific content areas. Therefore, traditional assessment is useful as a primary indicator of student learning at a point in time. It is not indicative of retention or any aspect of learning beyond the subject matter itself. The extent of traditional assessment is its utility to the individual.

Conversely, the extent of authentic assessment reaches societal proportions. Garrison (2007) states that learning should be "a self-directed process contingent on individual choice and action" (p.37). Authentic assessment, such as performance tasks, portfolio construction, and product manufacture, allow students to participate in an exchange with the instructor and peers in an assessment environment far less authoritarian than the assignment of a grade based on a standardized exam. This exchange is pregnant with the skills needed to promote sound participation in a functioning, democratic society, such as an emphasis on cooperation, individual self-direction, continuous improvement, and meaningful participation in the learning process. Garrison (2007) indicates that "the best learning happens under a democratic system, as our ever maturing students increasingly assume the freedom and responsibility to make choices and direct their learning experiences"(p.38). Authentic assessments go beyond the individual and reach the very fabric of our democratic society. Students given the opportunity to participate in such learning activities experience the deeper meaning of learning. They experience the essence of education through both the individual self-empowerment and actualization in addition to the skills needed to function in and improve society in general.

Theoretical Conclusions

To conclude, an analysis of current assessment practices indicates an emphasis on measuring student learning based on performance on select standardized tests. In Pennsylvania, this manifests itself in the determination of a school as making adequate yearly progress based on PSSA results. The addition of Keystone Exams to determine readiness for graduation has added to this platform. Opponents argue that emphasis on standardized testing does not indicate true student learning and the assessment focus should be shifted to authentic assessments which provide students the opportunity to engage academic knowledge in proposing and producing solutions to real-world problems. This dialogue often aligns standardized testing with summative testing and authentic assessments with formative appraisals of learning. A proponent's argument for one type of assessment becomes extended to an argument against the other type. This supposed dichotomy is inaccurate as authentic assessments can be used both formatively and summatively. Through employment of the Classical Utilitarianism concept of "utility," both summative and formative assessments can be described as having value as they both serve a distinct useful purpose. Summative assessment provides information regarding a student's learning at the end of a passage of curricula. Formative assessment provides information regarding a student's progression towards a goal. As such, both types of assessment have utility.

Therefore, it is not the type of assessment, formative or summative, but nature of assessment that affects utility. Authentic assessments have greater utility than traditional methods of assessment such as fact-based short response examinations because of the Utilitarian concept of "extent." The extent of traditional assessments is the utility to the individual student and teacher. The extent of utility for authentic assessments reaches society in general. Students who participate in curricular and assessment activities based on finding real solutions to real, current societal issues, much in the tradition of the Social Reconstructionism, develop habits of learning and citizenship that encourage participation in and enhance the foundational strength of our democratic society. Students taught and assessed authentically using authentic curricula can partake actively as thoughtful citizens skilled in working collaboratively to achieve individual self-actualization and the perpetuation of societal ideals. This is the significance of authentic assessment over traditional methods. Whether authentic assessment is formative or summative, the emphasis on student participation in real-world, modern-day issues propels the extent of its utility beyond the individual to society as a whole.

Considerations for Practice: Authentic Assessment for Student Learning

Before commencing with suggestions of how to incorporate authentic assessments into the classroom assessment environment, consider that Utilitarianism is a consequentialist system. As such, the results of the action far outweigh the methods used to realize the result. Therefore, the following suggestions should not be read as the 'correct' way to introduce authentic assessment but merely as an optional path.

Recognizing Authentic Assessment Options

While a complete shift to the real-world, community-based assessment projects of idealistic Social Reconstructionist theory may well represent a quantum leap too far across the current assessment landscape, there exists opportunities to incorporate the type of authentic assessment methods found to increase student motivation and achievement: namely, product manufacture, performance, and portfolio assessment. Product manufacture, as the name suggests, refers to anything that students "make" to show their learning. Some examples at the elementary levels would include posters, pamphlets, and short writing assignments. In the higher grades, students manufacture items such as multi-media documents and research papers, as well as the content specific items found in the industrial arts shops, family and consumer science labs, and business classrooms. Performance assessment refers to students "doing" something to show their learning. This could include class presentations, speeches, musical performances, physical education assignments, showing the right way to set up a science experiment, modeling safety procedures in a construction class, or participating in student theater. Lastly, portfolio assessment can either be "performance" or "learning" based. The performance portfolio is a collection of student's work over time that meets the standards of the course curriculum and evidences student learning (Wiggins & McTighe, 2007). On the other hand, learning portfolios provide a better example of how student work has grown over time (Wiggins & McTighe, 2007). Earlier pieces often remain in the portfolio even if they do not reflect the high standards of later work. Evidence is accompanied by student reflection pieces, self-assessment, and strategies for making changes to thought processes which provide a metacognitive map of student growth (Fenwick & Parsons, 1999; King, Patterson, & Petroelje-Stolle, 2008). The learning portfolio is seen as a continuing work in progress, not a finished product as with performance portfolios. Once familiarity with authentic assessment options has been achieved, the current classroom assessment environment can be surveyed.

Surveying Current Practice

Stiggins & Conklin (1992) introduced the concept of individual classroom assessment environments consisting of a number of teacher-based elements including teacher's purpose for using an assessment and the assessment method. The teacher, administrator, or instructional team can inventory the amount and type of assessments used in the classroom. This can be as informal or formal as the team sees fit. The key outcome is that participants build a picture of what assessments are currently used, how they are used, and why they were selected for use. The team can then identify specific areas that are suited for the introduction or expansion of authentic assessments.

Incorporating Authentic Assessment

The incorporation of authentic assessment into the classroom environment can involve a major undertaking or a number of smaller, but still significant adaptations. Larger changes at the elementary level perhaps include, for example, a requirement for students to construct a "citizenship portfolio." This portfolio could include a collection of artifacts from both school projects and out-of-school activities showing how students have met standards relating to character and citizenship development. At the end of the school year, students are required to speak with their teacher about the artifacts in the portfolio or make a brief presentation to classmates. Student portfolio assessment could also provide an opportunity for community celebration of citizenship character if parents and community members were invited to an exhibition of student portfolios. At the higher grades, schools could require that a senior graduation project include elements of a service-learning project based in the local community. Again, the student would collect artifacts describing the identification of a current local issue, plans for involvement in the issue, examples of student involvement in providing solutions to the problem, and exhibits of action based on the issue. Opportunities for community involvement are endless. We must encourage our students to become involved in the serious business of adult responsibility in a democratic society.

Smaller changes at both elementary and secondary levels revolve around the limitation of assessments and assignments based on traditional assessment methods, such as fill in the blank worksheets and multiple-choice tests. Teachers can provide variety to the classroom assessment environment by replacing some of these assessments with authentic assessments centered on performance, production, and portfolio construction. Perhaps a department decides that all teachers will provide a minimum of 50% authentic assessment options during the first year of incorporation. This could be expanded as instructors become more comfortable with authentic assessment and begin to realize the benefits.

The form of authentic assessment introduced to the classroom is not overly important. Remember, Utilitarians do not prescribe the method. The importance lies in the consequence of the incorporation of authentic assessments into the classroom environment realized through the presence of key elements of authentic testing. Specific teacher feedback, teacher-student dialogue, student-student dialogue, and student use of feedback all promote student participation in their own learning. And students taught to participate democratically in assessments of their own learning will receive encouragement to participate more fully in the democratic processes that exist outside familiar school surroundings. It is the Social Reconstructionist belief that democratic procedures learned in school will lead to a stronger democratic society. Affording our students the occasion to participate in these processes when we assess student learning is an opportunity that all classroom practitioners can create.

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The Blended Science Observation Protocol: Framing Content-Specific Indicators with a Common Language

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Researchers have addressed the complexity of teaching and learning and have effectively translated this body of knowledge into "frameworks" to organize and communicate professional practice (Danielson, 1996; Marzano, 2007). Comprehensive and generic frameworks have been widely implemented and serve as the basis for professional development, peer coaching, mentoring, reflection, and supervision. For example, The Pennsylvania Department of Education has adapted Danielson's *Framework for Teaching* as the basis of its teacher evaluation forms (e.g. PDE-426, 427, 428; see www.pde.state.pa.us). The Danielson Framework has a number of noteworthy features that have contributed to its widespread use: it is publically known, comprehensive in nature, widely used, and is based on common themes of practice that can be demonstrated in diverse ways. Importantly, it is "grounded in research on effective teacher practice" (Danielson, 1996). The Danielson Framework provides a common language for professional standards and practice. It can provide a roadmap to, and for, navigating through the complex territory of teaching (Danielson, 1996).

Generic frameworks, however, do not address all the qualities associated with good teaching. For example, in the authors' field of science, the generic framework is not clear in regard to inquiry and the nature of science as described in the National Science Education Standards (National Research Council, 1996). K-12 teachers report that 39% of their instructional time is spent on inquiry (Marshall, Horton, Igo & Switzer, 2009). Is this true? What does this inquiry look like? What is the quality of the inquiry that is taking place in the classroom? Because the Danielson Framework was designed to be generic, it does not address these discipline-specific questions and is not effective for our purpose of teacher professional development in science. We sought a more useful protocol that could be used alongside the Danielson Framework, yet would include more discipline-specific language and practices in its indicators of effective instruction. We therefore sought to combine a reliable and validated inquiry-oriented classroom observation protocol and a well-known framework that provides a common context and language for all educators. Specifically, we have integrated indicators of a science-specific protocol – the Reformed Teaching Observation Protocol – into the familiar domains and components of Danielson's Framework in order to create a "blended" protocol.

Blending Two Instruments:
The Reformed Teaching Observation Protocol and Danielson's Framework

Science-specific classroom observation protocols have been developed and used among relatively small groups of educators and researchers and have been useful in helping teachers examine their practice. Unfortunately, these instruments have not been widely used by teachers or administrators. This is especially regrettable given the increasing emphasis on pedagogical content knowledge and the call for more preparation in specific content areas. In our search for a science-specific protocol, we found several instruments that have value. Examples of science-specific instruments include the Reformed Teaching Observation Protocol (RTOP) (Sawada, Turley, Falconer, Benford, & Bloom, 2002), the Secondary Science Teaching Analysis Matrix (STAM) (Gallagher & Parker, 1995), the Expert Science Teaching Evaluation Model (ESTEEM) (Burry-Stock, 1994), and several related instruments derived from Horizon's Local Systemic Change Classroom Observation Protocol (Henry, Murray, & Phillips, 2007). We chose to focus our work on use of the RTOP as a validated science classroom observation tool that is standards based, inquiry oriented, and student centered. It is designed to measure the extent to which K-20 mathematics and science classroom practices move away from the traditional didactic mode of teaching towards a "reformed" or inquiry approach. It is interesting to note that the RTOP was also designed to measure reform in the teaching of mathematics. Unfortunately, components of this instrument are organized differently from those of the more familiar Danielson Framework.

Our goal was to integrate the 25 RTOP indicators into the four domains and 22 components of: 1) Planning and Preparation, 2) The Classroom Environment, 3) Instruction, and 4) Professional Responsibilities. After careful examination of each RTOP indicator, the authors assigned them to one of four domains of the Danielson Framework. In addition, the indicators were further organized into the appropriate components within each domain. This alignment has resulted in a "blended" protocol that effectively spans across three domains and ten components of the Framework (*Figure 1*). A conversation with Dr. Danielson (personal communication, December 2010) revealed her enthusiasm for additional avenues to leverage her research-based framework for the improvement of professional dialog. Including content specific language would serve to make the components clearer and more relevant in science and mathematics.

Our Blended Science Observation Protocol is noteworthy for several reasons. First and foremost, it provides a mechanism to collect data using a set of reliable and validated indicators that have been correlated with student achievement. In operation, each indicator is scored using a 5-point Likert scale, with a score of zero representing no evidence and a score of four representing a significant and descriptive indicator. Scores can be averaged within each domain such that the feedback is widely recognizable by K-12 teachers and administrators. It is important to realize that the blended protocol is focused solely on exemplary science classroom practices as defined by national recommendations rather than on common characteristics of effective teaching. For this reason, several components of Danielson's Framework are not represented in the blended model. For example, the blended model is silent with respect to "managing student behavior" (component 2d), "communicating clearly and accurately" (component 3a), and all of the components within domain four ("professional responsibilities"). This is not to say that these characteristics of teaching are unimportant, but in and of themselves they do little to focus professional dialog on inquiry learning. Therefore, we are not advocating that educators utilize the blended protocol in lieu of the comprehensive Danielson Framework, but rather we envision that the blended protocol will add additional value to the framework by increasing the resolution within specific content areas. To illustrate how this may occur in practice, consider the authors' specific context: while the curriculum supervisor's role has been to focus professional dialog through use of the blended protocol, the building principal has engaged teachers in reflection through the use of the comprehensive Danielson Framework. The resulting professional dialog is therefore both comprehensive and of significant depth relative to pedagogy important to inquiry-based science. We envision that additional content areas could similarly align indicators specific to their disciplines to create a "suite" of fully-aligned protocols that would share the common language of the Framework, yet more effectively capture the nuances of each content area.

Figure 1: The Blended Science Observation Protocol

DOMAIN 1: Planning and Preparation

Component 1a: Demonstrating Knowledge of Content and Pedagogy
- The teacher has a solid grasp of the subject matter content inherent in the lesson.

Component 1b: Demonstrating Knowledge of Students
- The instructional strategies and activities respect students' prior knowledge and the preconceptions inherent therein.

Component 1c: Selecting Instructional Goals
- The lessons involve fundamental concepts of the subject.
- The lessons promote strongly coherent conceptual understanding.

Component 1e: Designing Coherent Instruction
- In the lessons, student exploration precedes formal presentation.
- Elements of abstraction (i.e., symbolic representations, theory building) are encouraged when it is important to do so.
- Lessons encourage students to seek and value alternative modes of investigation or of problem solving.
- Connections with other content disciplines and/or real world phenomena are explored and valued.
- The lessons are designed to engage students as members of a learning community.

Component 1f: Assessing Student Learning
- Students are reflective about their learning.

DOMAIN 2: The Classroom Environment

Component 2a: Creating an Environment of Respect and Rapport
- There is a climate of respect for what others say.

Component 2b: Establishing a Culture for Learning
- Active participation of students is encouraged and valued.
- Intellectual rigor, constructive criticism, and the challenging of ideas are valued.

DOMAIN 3: Instruction

Component 3b: Using Questioning and Discussion Techniques
- The teacher's questions trigger divergent modes of thinking.
- There is a high proportion of student talk and a significant amount of it occurring between and among students.
- The metaphor "teacher as listener" is very characteristic of the classroom.

Component 3c: Engaging Students in Learning
- Students use a variety of means (models, drawings, graphs, symbols, concrete materials, manipulatives, etc.) to represent phenomena.
- Students make predictions, estimations and/or hypotheses and devise means for testing them.
- Students are actively engaged in thought-provoking activity that often involves the critical assessment of procedures.
- Students are encouraged to generate conjectures, alternative solution strategies, and/or different ways of interpreting evidence.
- Students are involved in the communication of their ideas to others using a variety of means and media.
- The teacher acts as a resource person, working to support and enhance student investigations.

Component 3e: Demonstrating Flexibility and Responsiveness
- The focus and direction of the lessons is often determined by ideas originating with students.
- Student questions and comments often determine the focus and direction of classroom discourse.
- In general the teacher is patient with students.

Applications for the Improvement of Professional Practice

The impetus for the creation of the Blended Science Observation Protocol was the need to effectively communicate and measure best practices in inquiry-oriented science instruction among a diverse range of teachers and administrators in order to maximize students' opportunity to learn. The National Science Education Standards remind us that "students cannot be held accountable for achievement unless they are given adequate opportunity to learn science." Capitalizing on the wide use of Danielson's Framewor*k,* we are seeking to more effectively introduce science-specific indicators of "opportunity to learn" to pre-service candidates, newly hired teachers, seasoned practitioners, principals, and administrators. The blended protocol provides a common language for professional standards and practice as well as provides teachers with an opportunity to improve their professional practice through self assessment, personal reflection and professional conversations. The National Research Council (1996) makes this powerful statement:

> At the classroom level, some of the most powerful indicators of opportunity to learn are teachers' professional knowledge, including content knowledge, pedagogical knowledge, and understanding of students; the extent to which content, teaching, professional development, and assessment are coordinated; the time available for teachers to teach and students to learn science; the availability of resources for student inquiry; and the quality of educational materials available.

These opportunities are not really different entities *per se*, but are each designed to reach the same goal. Our approach to meeting the challenge of assessing opportunity to learn science was to examine how teachers teach and provide a means for teachers to reflect on their content knowledge, pedagogy, assessment, and student learning**.** When implementing use of the blended protocol in our context, teacher and observer review the lesson in a post-observation conference in order to come to consensus regarding the degree to which each indicator was present, along with the evidence to support the decision. Reflection and coaching provides teachers with focused areas for professional growth in the context of Danielson's Framework.

To more fully ascertain the benefits of using the Blended Science Observation Protocol to augment the versatility of the full Danielson Framework, a small group of science teachers was anonymously surveyed after participating in post-observation conferences that focused dialog on each of the instrument's twenty-five indicators. All of the responding teachers (n=11) agreed that the blended protocol further clarifies for them what science and teaching should look like in each domain of the Danielson Framework (55% indicated *strong* agreement). They also were unanimous in agreeing that the science-specific indicators are useful in conveying best practices to principals and assistant principals who are knowledgeable about the Framework, but do not have a background in science. Furthermore, all responding teachers agree that the blended protocol will help create a shared vision of science teaching and learning among teachers and administrators.

In summary, we have begun to realize the benefits of aligning content-specific indicators with the components of generic frameworks in order to focus teachers and administrators on pedagogical content knowledge in an effort to maximize student learning. Although effective indicators and frameworks present theoretical, technical, and social challenges as we attempt to utilize them in teacher supervision, focusing on the skills necessary to effectively assess opportunity to learn must be a priority for teachers and administrators. This blended instrument is one effort to examine the opportunity to learn and engage in professional dialog in order to understand, analyze, and apply feedback to improve practice.

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Web 2.0: Collaborating to Create Dynamic Learning Experiences for New Teachers

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Introduction

The advances in new information communication technologies (ICTs), in particular Web 2.0 technology, have provided new avenues for schools to create dynamic learning environments. However, as aptly pointed out by Greenhow, Walker and Kim (2009-10), "Despite the potential of technology for learning and teaching, successful integration of ICTs have typically been slow to materialize in schools" (p. 63). How do we find ways to integrate Web 2.0 experiences in the classroom to reach the digital learners when educational institutions are filled with "digital immigrants" (Prensky, 2001) often reluctant to incorporate these technologies? A possible solution is to form partnerships with schools of education in universities and expose new in-service teachers entering the field with the benefits of Web 2.0.

Teacher Learning Communities

Collaborative learning environments are learning environments where teachers form groups to share and discuss professional development ideas. Research on effective professional development highlights the importance of collaborative and collegial learning environments that help develop communities of practice able to promote school change beyond individual classrooms (Clark, 2001; Darling-Hammond & Richardson, 2009; Hord, 1997; Knapp, 2003; Louis, Marks, & Kruse, 1996; Romano 2008; Ullman, 2009). A learning community allows teachers to explore new areas while having the support of the group. The most powerful element of a collaborative learning environment is this natural support system that forms as all members share common interests, goals and experiences. Teacher learning communities bring focus and unity to development efforts. The positive nature of collaborative learning environments makes it a natural fit for a new teacher induction program (Taranto, in progress).

School – University Partnership in Action

Effective new teacher induction programs develop a culture of continual professional development. A natural partnership in this endeavor is one between a school district and local schools of education. A study on effective induction programs for new teachers conducted by Davis and Higdon (2008) compared a school-only induction program and a school/university induction program. The partnership between the school and university to produce an induction program produced more favorable results as measured by the Assessment Practices in Early Elementary Classrooms measure. A partnership between schools and teaching universities is a likely joint venture. Universities with schools of education have a vested interest in the candidates that they produce that should go beyond the distribution of the diploma; the collaborative learning community model lends itself to this partnership.

In the Canon-McMillan School District, the 2008-2009 induction program incorporated a university component. Dr. Greg Taranto was charged with leading the district's induction group. While maintaining the district's self-contained induction program and with the support of the newly appointed superintendent, Dr. Helen McCracken, the incorporation of a learning community took place. Dr. Silvia Braidic, associate professor for California University of Pennsylvania, who teaches in the Administrative Program for Principals, as does Dr. McCracken who serves as an adjunct professor, has partnered with Dr. Taranto on prior initiatives, and was interested in the opportunity to work with the school district.

Enhancing Professional Development with Web 2.0 Technology

The school district already had a successful induction program in place. New teachers would meet on a monthly basis to explore new instructional strategies. They were required to submit a weekly reflection sheet, which was shared with their mentors and submitted to central office for review. The program's new addition was not only adding the expertise of a university professor, but also incorporating a mechanism to connect the group to collaborate and share ideas through Web 2.0 technology. A wiki was created to act as the vehicle to communicate information and allow new teachers the opportunity to collaborate with each other, school administrators, mentors, and university faculty. As a result, participants were more likely to form a "highly participatory culture" (Fahser-Herro & Steinkuehler, 2009-10) where they become active members who produce content, collaborate on ideas, and support one another. Most importantly, they were exposed to the same kind of Web 2.0 technologies that should be present in their classroom experiences.

Wikis, which fall in the family of social operating systems, are described as "technologies likely to have a large impact on teaching, learning, or creative expression within learning-focused organizations" (Johnson, Levine, & Smith, 2008, p. 3). Social operating systems focus on more than simply content: The most powerful component of these systems is the development of the relationships and networks. Online collaboration tools provide great potential as viable vehicles for new teacher learning communities (Taranto, in progress). Wikis can support the creation and maintenance of learning communities.

Successful collaboration depends on the creation of a learning community. Consequently, attention needs to be paid to community building from the start of the wiki. By creating and implementing the use of the wiki effectively, a strong sense of community can assist groups in moving through the phases of their development: (a) setting the stage, (b) modeling the process, (c) guiding the process, and (d) evaluating the process (Palloff & Pratt, 2005). In this experience, setting the stage involved a number of activities, including an explanation of the wiki and the guidelines for its use. This took place first through a face-to-face professional development session and then followed by the development and utilization of the wiki. Teachers had to understand the wiki is a virtual place to meet as an extension to their face-to-face induction sessions. Because it is important to model technology usage in the appropriate context to nurture technology self-efficacy (Ertmer & Ottenbreit-Leftwich, 2010; Taranto, 2010), the wiki was used in the context of the online learning community. Finally, new teacher reflections provided feedback to help evaluate the process that will be used in future planning for induction.

Online Learning Community Pilot

The school district piloted the new format of combining a social networking system into the induction program. Dr. Braidic agreed to present differentiating instruction during a face-to-face professional development session with the new teachers. During the session, she reviewed key principles of differentiated classrooms and introduced teachers to a specific differentiated-instructional strategy. A differentiated-instructional strategy was introduced, examples were shared, and a guided hands-on session in creating a group activity utilizing the strategy was conducted. Then, to provide the new teachers with an opportunity to practice what was learned, they were asked to apply the strategy over the next six-week period.

A wiki was created with the new teachers invited to participate in the wiki experience. The following month, the teachers were asked to meet online rather than face-to-face. At that time, they were asked to submit their lesson plan with the differentiated lesson on the wiki to share with their fellow new in-service teachers. The following questions were posted to help guide the teachers in the reflection process via the discussion board:

1. How have you utilized the differentiated instructional strategy in your class? Attach your sample with your name in the DI Resource Center under *Lesson Plans*.
2. What strengths did you find as a result of using the strategy with your students?
3. What challenges did you face?
4. What questions has this raised for you?
5. Take time to post your response and read and respond to some of your colleagues.

The discussion board resulted in an explosion of professional discourse with dialogue on the topic of differentiated instruction between teachers with Dr. Braidic and Dr. Taranto. The wiki's discussion board allowed for the creation of a collaborative learning environment of teachers that reached beyond the walls of their school. By having direct access to Dr. Braidic, the teachers had the opportunity to ask questions and seek support after the application of the newly acquired instructional strategy. Additionally, the dialogue reinforced the fact that everyone is experiencing challenges and issues, and they were not alone in the induction process.

Sharing, Collaborating, and Networking for Teacher Success

As a result of utilizing the Web 2.0 technology in the form of the wiki, the new in-service teachers were able to share, collaborate, and network on a level that was not possible prior to the wiki's implementation. On the topic of differentiated instruction, the discussion board exceeded 120 posts where teachers shared lessons, inquired about strategies, discussed difficulties, sought clarification and help, and overall supported one another's accomplishments. The experience not only created an online community of learners, but also exposed the teachers to the positive benefits of incorporating wikis into a learning environment. Melissa, an eighth-grade social studies teacher, provided a response that truly captures the success of the experience as she writes:

> I really liked using the wiki. Not only did we get to exchange ideas, but I was able to see what you can create on a wiki and continue to use the same discussion for more than one day. I was confused on the concept and how it could be used in a classroom setting, but this made it clear for me that it is a great tool for discussion. I would really like to participate in these more

> often...we can discuss new ideas and techniques with our colleagues and a lot of times that branches out into different topics.

A fifth-grade elementary teacher, Tyler, writes:

> I find the Wikispace to be much more beneficial. I feel that I repeat myself a lot on the reflection sheets [new teachers complete weekly reflection sheets as part of the induction program, which are sent to the induction coordinator for review and feedback], and it is the same questions every week. With the Wikispace page, I was able to get different ideas and viewpoints. I think the Wikispace makes the reflection, discussion, and sharing more meaningful. I wouldn't mind doing something like this more often.

In addition to the positive qualitative responses to the experience, the teachers completed a survey based on a four-point Likert scale. The beginning teachers overwhelming supported the online learning community experience (*see Table 1*).

Table 1. Pilot study post-survey results

Criterion	*M*	*SD*
The discussion board experience helped me generate new ideas.	3.45	0.69
The online learning community wiki as a place to collaborate with new and experienced teachers, administrators and educators in the field.	3.65	0.49
Rate the wiki as a venue to interact with other new teachers with similar challenges, goals, and ideas.	3.90	0.31
How would you rate the following components of the wiki?		
a. Home Section	3.16	0.50
b. Resource Pages	3.39	0.61
c. Discussion Boards	3.84	0.37
d. Embedded Widgets	3.19	0.66
How would you rate the wiki experience overall?	3.40	0.60

Note. *N* = 20. Rating scale 1 to 4; 1 = lowest rating, 4 = highest rating.

Overall, the experience allowed for the beginning teachers to feel supported in a preferred method of professional development delivery. As found with Palloff and Pratt (2005), similar findings were a result from the wiki induction experience:

- Assisted with deeper levels of knowledge generation;
- Promoted initiative, creativity, and critical thinking;
- Allowed individuals to create a shared goal for learning and form a foundation for a learning community; and
- Addressed various learning styles

Future Direction

Today's new educator is looking for ways to communicate, share, network and seek support in a more efficient manner. In this pilot program, Web 2.0 technology was explored as a viable tool to create dynamic support systems for new in-service teachers. The positive response from the new teachers warranted the school district to expand the program. As a result of the initial success of the pilot study, a formal online learning community has been incorporated into the year-long Canon-McMillan School District's induction program. Four professional development themes were added to the induction program: technology integration, assessment and grading, differentiated instruction, and special education. Mixed methodology through descriptive statistics and qualitative measures has been gathered to assess the depth of the impact and receptiveness of the online community on the 2009-2010 new in-service teacher program (Taranto, in progress). The community has been expanded to involve more experienced educators, both from the district and from a number of local universities.

As more and more teachers, administrators, and higher education faculty have access to technology and new information communication technologies, opportunities to collaborate, participate, and define how knowledge is organized are occurring at a dramatic pace. These opportunities make it possible for learning communities to engage more individuals from various contexts, to operate in new ways, and to sustain collaboration over longer periods of time. Wikis stand out as natural tools for facilitating and supporting the activities of a learning community, both during the face-to-face induction sessions and afterwards.

The critical affordance of a wiki that fosters these activities is its versatility: the content, the navigation, and the interface of a wiki can be customized and updated to reflect the needs of the specific group of learners. Wenger (1998) describes a community of practice along three dimensions – what it is about, how it functions, and what capability it has produced. Wikis are uniquely suited to address these dimensions for the following reasons: they possess the flexibility to support the joint enterprise of the community as it evolves and changes (what it is about); the wiki environment fosters the social aspect of engagement among the community's members (how it functions); and wikis support the documentation of communal resources that represent the collective work and memory of the community over time (what capability it has produced). As a result, an optimal professional development induction experience can emerge.

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Curriculum Issues In Alternative Education: Teacher And Administrator Perceptions

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Introduction

Recent research on graduation rates indicates that nearly one-third of high school students are not graduating on time with a high school diploma in the United States. Given this reality, the importance of solid, research-based alternative education programming cannot be overstated. This is particularly true in light of the documented social service, labor, and other costs to our communities of high school drop outs. A report from the Alliance for Excellent Education (2009) provides context related to the dropout problem. According to that report:

- *Each year over 35,000 students in Pennsylvania do not graduate*
- *Dropouts from the class of 2009 will cost the state almost $9.1 billion in lost wages, taxes, and productivity over their lifetimes*
- *Pennsylvania would save more than $505 million in health care costs over the course of the lifetimes of each class of dropouts had they earned their diplomas.*
- *Pennsylvania households would have almost $3 billion more in accumulated wealth if all heads of households had graduated from high school*
- *About $4 billion would be added to Pennsylvania's economy by 2020 if students of color graduated at the same rate as whites*
- *If Pennsylvania's high schools graduated all students ready for college, the state would save almost $125 million a year in community college remediation costs and lost earnings*
- *Pennsylvania's economy would see a combination of savings and revenue of about $288 million in reduced crime spending and increased earnings each year if the male graduation rate increased by just 5 percent. (p.1)*

Calculations on the cost of dropout vary from study to study and state to state; however, the bottom line appears to be consistent. Dropout comes with a steep economic cost, and preventing dropout is an important endeavor for all school districts.

Alternative education programming serves a number of important roles in the school system and for many districts is an integral component of the overall delivery of education in k-12 and dropout prevention efforts. Because of this, it is evermore important to address the curricular and other needs of students being served in these settings. In Pennsylvania, as in many states, alternative education commonly refers to an array of services or programs provided for students at highest risk for dropout from school. There are some indications that an emphasis in the mid 1990s through mid 2000s upon serving disruptive youth has moderated somewhat as the state has retreated from what had been a very modest funding role to support efforts in removing disruptive youth from the regular classroom. More local control in programming has in many cases broadened the population of students to include students who are at-risk for dropout for other reasons such as falling behind in academic credit and failing in school. Nonetheless, the predominant population in alternative programs is the disruptive student as defined in Pennsylvania's Act 30 of 1997 (Pennsylvania Department of Education, 2011):

1) disregard for school authority, including persistent violation of school policy and rules;
2) display or use of controlled substances on school property or during school activities;
3) violent or threatening behavior on school property or during school-affiliated activities;
4) possession of a weapon on school property, as defined under 18 Pa. C.S. 912;
5) commission of a criminal act on school property or during school-affiliated activities;
6) misconduct that would merit suspension or expulsion under school policy; and
7) habitual truancy.

This article explores several aspects of Pennsylvania teacher and administrator perceptions related to the curriculum and student outcomes in alternative education.

Curriculum Issues in Alternative Education Settings

Curriculum Focus in Alternative Education

Hosley, Hosley, and Thein (2008) conducted a study of alternative education practices that included an analysis of teacher and administrator perceptions in the area of alternative education curriculum. The study, which included 180 teacher and 141 administrator respondents, provides insights into the curriculum interests and foci of alternative education programs. For example, the survey sought to find out how teachers and administrators viewed curriculum emphasis in alternative programming. Teacher respondents most often indicated academic change (66.5%) and behavior change (62%). Administrators were more distributive in their responses but also viewed behavior change (42.6%) and academic change (41.8%) as the top foci. Additionally, 41.3% of teacher respondents and 46.1% of administrators indicated that the curriculum focus balances academic, behavior, and therapeutic change equally (Table 1).

Table 1. Curriculum focus. Perceptions of administrators and teachers regarding the focus of curriculum in alternative education programs.

Curriculum focus	Administrators (N=141) (%)	Teachers (N=180) (%)
Focuses upon behavior change	42.6	62
Focuses upon therapeutic change	17.7	30.2
Focuses upon academic change	41.8	66.5
Balances academic, behavior, and therapeutic change equally	46.1	41.3
Is individualized for each student	51.8	58.7
Other	—	—

Respondents were encouraged to check all that apply.

A separate item on the survey asked teachers and administrators to rate the *importance of* selected components in alternative education programs (Table 2). Behavior change and academic programming were rated highest and followed closely by disciplinary and therapeutic programming.

Table 2. Importance of selected components in alternative education programs.

Components	Administrators		Teachers	
	Mean	SD	Mean	SD
Academic Programming	4.30	.85	4.34	.77
Therapeutic Programming	4.13	.88	4.24	1.07
Behavior Change Programming	4.39	.73	4.46	.77
Disciplinary Programming	4.13	.76	4.32	.80
Career/Post Secondary Preparation Programming	3.76	1.03	3.83	1.06
Life Skills and/or Social Skills	4.16	.86	4.28	.98
Vocational/Technical Skills	3.85	4.45	3.74	1.34

Curriculum Content in Alternative Education

Teachers and administrators acknowledge that remediation is a primary role of curriculum in alternative education. In fact 83.9% of teachers and 78% of administrator respondents indicated that remediation of skills and knowledge was a role of the alternative education curriculum. Interestingly, nearly 80% of both administrators and teachers indicated that the same curriculum available in the regular classroom is available to students in the alternative education setting. Among teachers, 60.6% indicated that an alternative curriculum, not otherwise available to regular education students, was included in the curriculum offerings of their program. In alternative schools administrators (45.4%) and teachers (41.1%) indicated that a college preparation academic program is available to students. Nearly one-third of respondents (Administrators, 34%; Teachers, 31.7%) indicated that vocational programming was available to students (Table 3).

Table 3. Curriculum content of alternative education programs
as perceived by administrators and teachers.

Curriculum content	Administrators (N=141) (%)	Teachers (N=180) (%)
Vocational education	34	31.7
College preparation academic program	45.4	41.1
Remediation of skills and knowledge	78	83.9
Alternative curriculum not otherwise available to regular education students	42.6	60.6
The same curriculum that is available in the regular classroom	79.4	79.4
Other	9.9	15.6

Alternative Education Curriculum Vs. Regular Education

Hosley, Hosley, and Thein (2008) indicate that 29.1% of teachers cite minimal differences between regular education and the alternative education curriculum; conversely, 70.9 percent would attribute differences to be more than minimal. According to teacher respondents, age and grade differences make it necessary to implement varied curriculum within the same classroom (63.7%), curriculum is adapted individually in alternative education (57.5%), there is more latitude in the alternative education classroom to change, adapt or create curriculum (70.4%), the alternative education classroom has fewer curriculum resources available than the regular education classroom (41.9%), and the teacher to student ratio is smaller in the alternative education classroom (82.7%). In addition, there is more emphasis placed upon social skills training (64.2%), working on personal issues (57.5%), and discipline (56.4%) in the alternative education classroom (see Table 4). Each of these factors has implications in the design and implementation of curricular offerings in addition to the potential student outcomes.

Table 4.
Similarities and differences between the alternative education curriculum and the regular education classroom curriculum: teachers' perceptions.

Aspects of Similarities and Differences	%
Minimal differences exist between Regular Education and Alternative Education curriculum.	29.1
Curriculum is adapted individually in Alternative Education.	57.5
Age and grade differences in the Alternative Education classroom make it necessary to implement varied curriculum within the same classroom.	63.7
There is more latitude in the Alternative Education classrooms to change, adapt or create curriculum.	70.4
Alternative Education has the same or more curriculum resources available as the Regular Education classroom.	29.1
Alternative Education has fewer curriculum resources available than the Regular Education classroom.	41.9
There is more emphasis on social skills training (decision-making, communication, conflict resolution, etc.) in the Alternative Education Classroom than is typically found in the Regular Education classroom.	64.2
More emphasis is placed upon discussing or working on personal issues in the Alternative Education classroom.	57.5
More emphasis is placed on discipline in the Alternative Education classroom.	56.4
Students in Alternative Education have curriculum options available to them that are not ordinarily available in Regular Education.	27.4
Students in Alternative Education are excluded from participation in some parts of the curriculum that are ordinarily available to Regular Education students	39.1
Every Alternative Education student participates in transition programming.	24.1
The teacher to student ratio is smaller in the Alternative Education classroom.	82.7
In general, students seem to maintain current academic levels or make academic gains after participation in Alternative Education.	71.5
In general, students seem to lose ground academically after participation in Alternative Education.	7.8
Entry and exit academic levels are assessed in the Alternative Education program.	25.7

Discussion

The survey results indicated what many will find intuitive: 1) challenges in alternative education are formidable and include attending to behavior change, academic change and therapeutic change; 2) balancing the many aspects of curriculum is a difficult but important task; 3) teachers have the latitude to be creative and innovative with regard to curriculum; 4) differentiating instruction is among the most important skills and knowledge sets that a teacher in an alternative setting can have; 5) in order to appropriately differentiate instruction, adequate resources are required; and 6) instruction is often individualized and as such varies from an emphasis on remediation to vocational and, sometimes, college preparatory.

In the field of education there are many ways that we work to best meet the needs of individual students. We vary instruction by creating multiple paths for students to achieve academically. We design our classrooms to create safe and comfortable learning environments, encouraging students to take risks. We stay abreast of the most current and relevant research that will enhance and promote parent and community support. As teachers, we work hard to educate all students. The survey confirmed that alternative education teachers and administrators acknowledge that the at-risk student needs more than the regular education curriculum. Oftentimes, the at-risk student is placed in alternative education in hopes that the alternative education teacher and curriculum can make a breakthrough with performance that was unlikely to occur in a regular education classroom and curriculum.

The similarities and differences between the alternative education curriculum and the regular education curriculum are stark and a bit surprising. Given the challenges and needs in the alternative setting, one would think that the alternative education classrooms would be provided with more resources and educational materials than the regular education classroom, or at minimum be similar in comparison. The survey indicates that teachers are often left without adequate curriculum resources to meet all of the students needs in alternative education.

Without the necessary resources it is very hard to differentiate instruction to meet the needs of all the students. A major key to differentiated instruction is the premise that all the students are offered choices that are matched and tailored with tasks that are compatible with each student's learning style. The main focus of differentiated instruction is the teacher's ability to differentiate the content, process, and product of the curriculum according to the student's readiness, interests and learning profile. This can be achieved through a wide range of instructional as well as management strategies (Tomlinson, 2005). Although a skilled teacher can differentiate instruction and create a varied learning environment, the resources need to be in place to differentiate the content, process, and product of the curriculum. Most students coming to the alternative education classroom are academically behind grade level. Largely because of this, differentiating instruction is more of a challenge for the alternative education teacher. The only way for the alternative education teacher to ensure success for the student is to vary and differentiate instruction, oftentimes with very little resources or professional support.

Classrooms are so diverse today most teachers need to implement some form of differentiated instruction to ensure the success of the students. To differentiate instruction the element of time is a key factor. To ensure that the content, the process and product of the curriculum are differentiated to fully address the student's readiness, interests and learning profile, teachers need to spend a significant amount of time preparing the instruction to be taught at the instructional level for the student. This can be achieved but it takes time. Teachers and administrators indicate that students in alternative education must be exposed to curriculum that addresses disciplinary issues, behavior change, therapeutic issues and, often, social skills. With the amount of time required addressing these many and varied issues, the alternative education teacher's job instructing and differentiating becomes even more challenging.

The survey results also make it clear that for many alternative education students remediation must occur. If that is so, then how can the academic curriculum, the same state standards, the same post-secondary preparation and vocational education found in regular education also be effective in the alternative setting? Pressures to meet standards place our administrators and teachers in the awkward and untenable position of inferring that they can deliver the regular curriculum while providing remedial attention to academics, implementing behavior change programming, providing therapeutic programming and individualizing the students' experiences. Overwhelming? If it is overwhelming for teachers and administrators, simply imagine what the student is feeling. Our experience tells us that truly effective programs accurately assess the student's academic, behavioral and other needs and utilizing the assessment move forward. These programs focus less upon the rush to get the student through programming quickly and more upon reengaging student interests, establishing academic successes, and attending to the issues (mental health, social skills, behavior, etc.) that landed the student in an alternative setting in the first place.

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An Invitation to Write for Pennsylvania Educational Leadership

Denise G. Meister and Judith L. Zaenglein - Co-Editors
Pennsylvania Educational Leadership

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See the next page of this issue of *Pennsylvania Educational Leadership* for details regarding submission of manuscripts.

Manuscript Submission Guidelines

Content

Pennsylvania Educational Leadership provides for the sharing of formal and informal research related to the improvement of curriculum and supervision. Some issues may be thematic as determined by the editors in response to topics of timely interest. Submitted manuscripts should be responsive to this purpose and reflect research or analyses that inform practices in these areas.

Format

All submissions must be prepared using word processing software and saved in *Microsoft Word* (DOC) or rich text format (RTF). Manuscripts must comply with the guidelines in the *Publication Manual* of the American Psychological Association, sixth edition, 2009. Double-space all text, including quotations and references, use 1-inch margins for top and bottom, and use 1.25-inch right and left margins. All text should be Times New Roman 11-point font. Complete references should be placed at the end of the manuscript, using the "hanging indent" function. Additional article publication formatting details are listed on the *PEL* web site (http://citl.hbg.psu.edu/pel).

Submission

Submissions should be sent via e-mail to pascdpel@psu.edu. Submissions must include three separate files saved in *Microsoft Word* (DOC) or rich text format (RTF) as follows:

1. Cover Page – Include the information listed below in a separate file
    - Manuscript Title
    - Thematic Topic (if appropriate)
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2. Abstract – In a separate file describe the major elements of the manuscript in 100-150 words. Do not include your name or any other identifying information in the abstract.

3. Manuscript – In a separate file include the manuscript, references, and supporting charts, table, figures, and illustrations as defined above.

Review

Manuscripts are peer reviewed as they are received. Manuscripts must be received by the second Friday in September for consideration for the fall issue and by the first Friday in February for the spring issue. It is the policy of *PEL* not to return manuscripts. Authors will be notified of the receipt of the manuscript. After an initial review by the editors, those manuscripts that meet the specifications will be sent to peer reviewers. Authors will be notified if the manuscript is judged to be not appropriate for review. Following peer review and editor review, the author(s) will be notified as to the status of the manuscript. The journal editors reserve the right to make editorial changes in the manuscript.