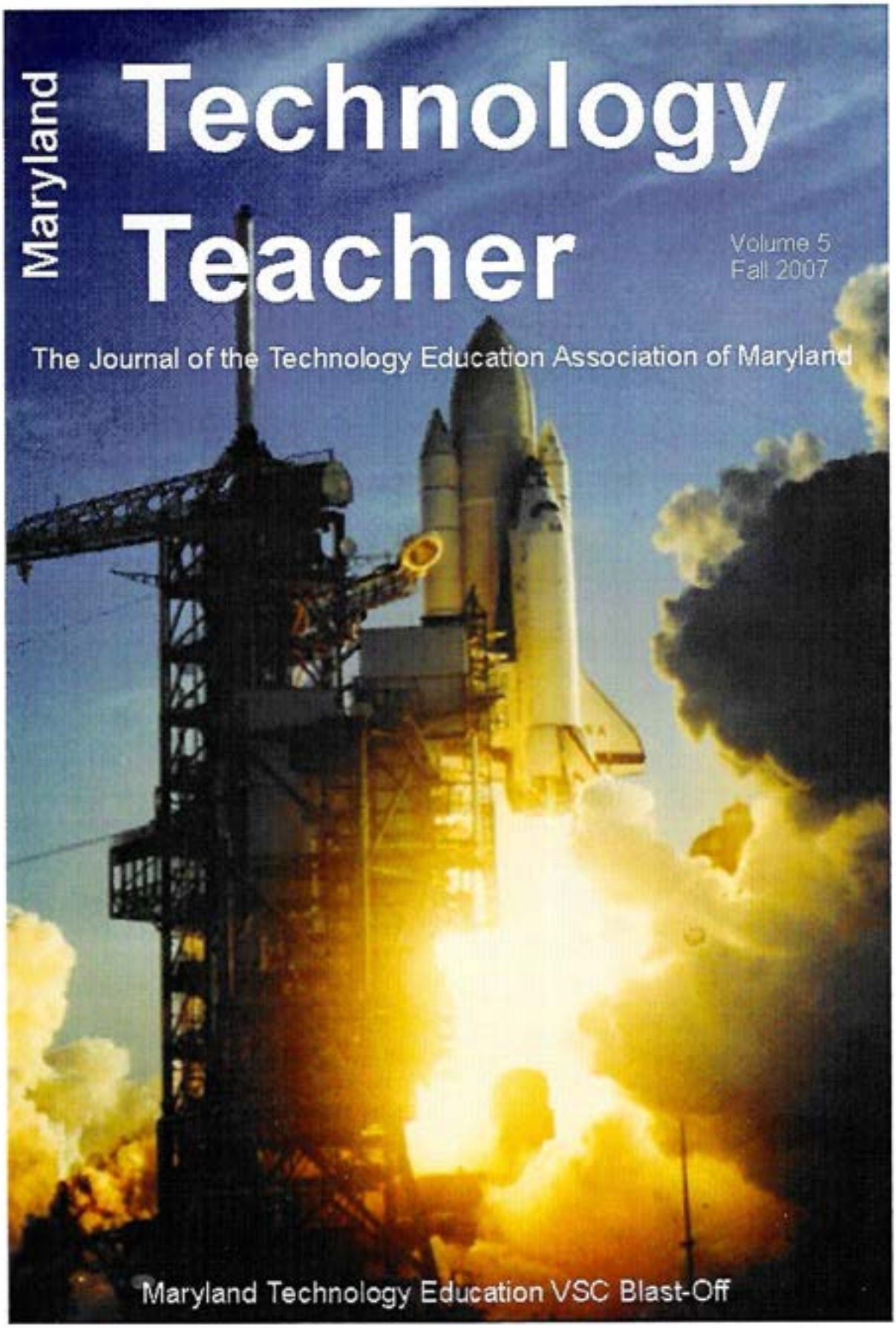
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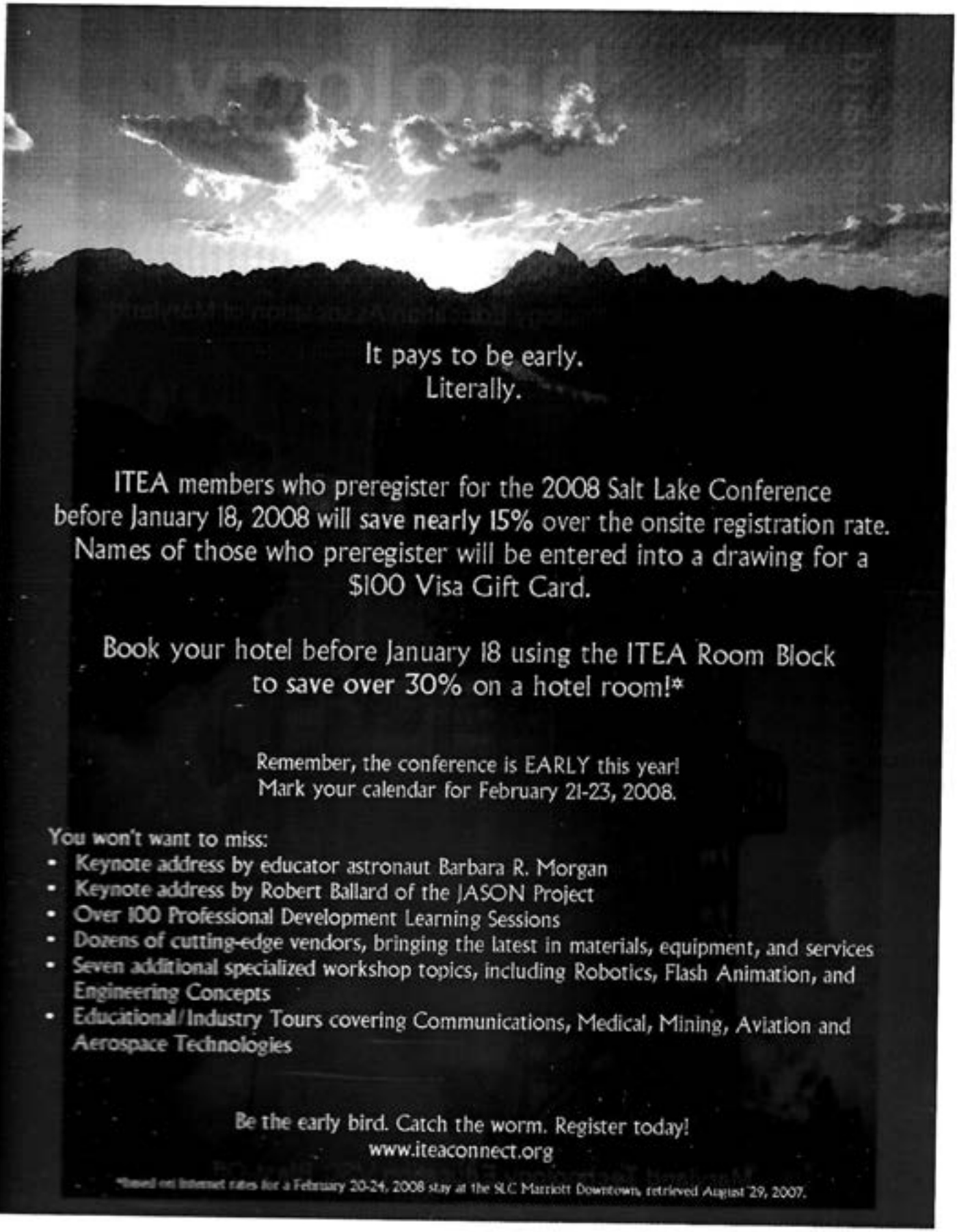
Maryland Technology Education VSC Blast-Off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Maryland Technology Teacher

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In This Issue:

The Maryland Technology Teacher is the official publication of the Technology Education Association of Maryland (TEAM) with executive offices at the Baltimore Museum of Industry, 1415 Key Highway, Baltimore, MD 21230.

President's Message

Michael Weglein
President, TEAM, 2006-2007

Greetings! This is TEAM's first print journal in over five years. Our organization, profession, and content area have changed dramatically over the last five years.

The State Curricular Framework for Technology Education has been replaced by a Voluntary State Curriculum for Technology Education. Maryland has joined a consortium of ten other states to create standards-based model course guides and assessments through the Consortium for the Advancement of Teaching Technology and Science (CATTS). CATTS is the professional development arm of the International Technology Education Association (ITEA). ITEA is the largest professional educational association, principle voice, and information clearinghouse devoted to enhancing technology education through experiences in our schools (K-12). Its membership encompasses individuals and institutions throughout the world with primary membership in North America.

CATTS promotes the use of the Standards for Technology Education created from ITEA's Technology for All Americans Project, a nationally supported initiative designed as a basis for curriculum and resources pertaining to the study of technology.

Last June, TEAM and representatives from counties from across the State had an opportunity to work with State and ITEA-CATTS leaders in an effort to better understand the new COMAR regulation and how CATTS model curriculum guides may be used to address the overarching standards, indicators, and objectives in the VSC. Counties were also given an opportunity to analyze their existing course offerings to identify VSC gaps. The three day workshop proved to be very beneficial to everyone involved and dispelled many misconceptions related to the CATTS guides and the new VSC.

The Maryland State Department of Education has implemented a five-credit pre-engineering program for high school students through Project Lead the Way (PLTW). PLTW is now taught in over half the counties in Maryland and over 50 high schools across Maryland. Student participants receive the technology education graduation credit by completing either Principles of Engineering or Introduction to Engineering Design. PLTW's Gateway to Technology middle school program is currently offered in numerous schools throughout Maryland.

The No Child Left Behind Act of 2001 has dramatically changed the way teaching endorsements are added. A Maryland teacher currently holding an endorsement in a secondary content area is no longer required to take any coursework to add the technology education endorsement. They simply need to pass the Praxis II 0050 Technology Education examination through Educational Testing Services (http://www.ets.org). This examination consists of 120 multiple choice questions.

TEAM has revised its constitution and by-laws to keep pace with our ever-changing world of technology. Regional representatives have been replaced with county specialists,

supervisors, or coordinators. The TEAM executive board has been streamlined. More responsibilities have been placed in the hands of the president-elect, president, and past president. The past-president now has the primary responsibility of planning the TEAM conference in October. The president has the primary responsibility of overseeing the awards nomination and selection process, as well as the TEAM awards dinner. The president-elect has the primary responsibility of overseeing all professional development initiatives other than the TEAM conference.

We are creating an open forum for award nominations. Nominations and selections will take place in the same academic year. The awards banquet and dinner will occur in February in conjunction with National Engineers Week.

TEAM will continue to hold its annual conference in October. Our conference includes sessions on the Maryland VSC, CATTS model course guides, Maryland Engineering Challenges, STEM, technology education curriculum modules, safety and liability in the laboratory, and small tools and equipment training. We will have numerous vendors participate, as usual.

It's a whole new ball game. This is not your father's industrial arts or post-industrial arts technology education program. As a content area that has struggled with its identity the last several years, I challenge all of you to examine your instructional practices and identified technology education courses to ensure we are delivering technology education in a consistent manner across this State. As a profession, we must tear down "the shops" that invoke memories of an industrial age gone by and replace them with applied technology and engineering design labs that focus on the practical application of mathematics and science to solve "real-world" problems. Yes --- we still need small tools, equipment, and machines. However, these same tools, equipment, and machines can no longer provide the foundation for our existence. Our identity must be defined by each of you in this era of assessment and accountability. This is our last stand. We are the only State in the country that has a graduation requirement for technology education. If we want to keep it, then everyone must agree to administer a final examination that tests the non-negotiables listed in the VSC. Become active in your school, your local school system, your professional organizations (TEAM and ITEA), and State activities.

Author

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Technology Education Initiatives

Gerald F. Day, PhD

These are exciting times in Maryland for technology education. There are many initiatives happening throughout Maryland that technology education teachers and administrators need to keep up with to be well informed.

State Voluntary Curriculum

The Voluntary State Curriculum (VSC) in Technology Education was approved by the Maryland State Board of Education in 2006. Starting in the fall of 2007, all local school systems must have technology education programs based on this new VSC. The VSC has specific standards that must be met. Many school systems have been having curriculum development workshops and professional development activities in order to assist their teachers in implementing new programs based on these standards.

Local school systems can use a variety of curricula to meet this mandate. Some counties are using the Center for the Advancement of Teaching Technology and Science (CATTS) materials. Specially, the CATTS Foundations of Technology curriculum guide can be used as the main course to deliver the required high school credit in technology education. Another option is to use Project Lead the Way curriculum material.

The Maryland State Department of Education, Division of Career Technology and Adult Learning , in cooperation with CATTS, has been holding professional development activities for selected teachers from several school systems to assist them in implementing the Foundations of Technology Education course.

UMES

The University of Maryland Eastern Shore has designed a new course centered around the CATTS Foundations of Technology curriculum. Started in the summer of 2007, the course EDTE 488 Foundations of Technology was offered for undergraduate and graduate credit. It is planned that this course will be offered throughout Maryland at satellite locations throughout Maryland.

An on-line course is also being developed for Foundations of Technology so that those who want to take this course through that modality can do so. This on-line course will be a hybrid course, meeting a few times during the semester. It is hoped that this on-line course will be implemented for the 2008-2009 school year.

Core Technologies courses will still be offered to continue work on the nine core technologies that Maryland has established as content organizers in technology education.

The Master's Degree in Career and Technology Education program has graduated over 60 teachers since its inception in 1999. The focus of the graduate program is on developing leaders and master classroom teachers. Many of the program's graduates are in leadership positions at the school and school system level. The program will continue to serve Maryland teachers in all areas of CTE including agriculture, business education, health education, family and consumer science, technology

education, trade and industrial education, and work-based learning. Emphasis is being placed on doing action research on the new technology education VSC, and related classroom management and instructional design issues.

TEAM

The Technology Education Association of Maryland (TEAM) will continue to host professional development activities to assist teachers and administrators. Their annual Tech Expo held on the third Friday of October will concentrate on the VSC. This concentration was kicked off in the fall of 2006 and will continue for the next few years. Presentations will be made by master teachers who have been successful in implementing the new VSC, and by experts in the field.

TEAM will also be publishing additional resources that will help classroom teachers. They will add to their Maley Monograph Series and disseminate specific techniques and design projects for teachers to use. They will continue to sponsor engineering challenges at the Baltimore Museum of Industry.

Maryland Center for Career and Technology Education Studies

The Maryland Center for Career and Technology Education Studies (MCCTES) has planned to expand their services to classroom teachers and administrators throughout Maryland. Under the leadership of Mike Shealey, former supervisor of Baltimore County Public Schools, the Center has started to focus on technology education, leadership, and science, technology, engineering and math (STEM) activities.

MCCTES is offering professional development workshops and courses to assist math, science and technology education teachers in implementing STEM activities and curriculum. The Maryland Center for Career and Technology Education Studies (MCCTES) has also been scheduling new University of Maryland Eastern Shore courses in technology education, such as Foundations of Technology and Engineering Design.

Project Lead the Way

The most closely related CTE completer program to technology education is Project Lead the Way, the high school engineering program. Over 50 schools have implemented this standards-based curriculum and enrollment continues to grow. The sponsoring higher education institution is the University of Maryland Baltimore County, who provides leadership and teacher training. There are four basic courses, with more to come in the future.

In Summary

Maryland is on the move of upgrading and standardizing the curriculum to deliver technology education throughout Maryland. Several initiatives are helping classroom teachers and technology education supervisors to meet the new mandate of technology education for the 2007-2008 school year. Maryland has also been a leader in technology education dating back to Donald Maley in the 1950's and 1960's, and Maryland has continued that tradition.

Author

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Career Academies: Making Education Meaningful

Ralph Olson

Career academies have been showing up in high schools and career and technology education centers throughout the United States. In 1969, the first career academy opened its doors at Thomas Jefferson High School in Philadelphia. The career academy was a result of collaborative efforts from the community, business education, labor, and government. The community was faced with high drop out and unemployment rates among the youth. The primary emphasis was toward high risk students in the beginning. Then, in 1982, with funding from American Express and Citigroup, the first Academy of Finance opened at John Dewey High School in Brooklyn, New York. In 1986, academies of travel and tourism were established in both New York City and Miami.

The National Academy Foundation (NAF) was established to oversee the quality and expansion of academies that emphasized finance, travel and tourism, and information technology. Expansion was more in some states than others over the next 15 years. Several associations were created to assist and oversee the growth of career academies.

Manatee County Florida was instrumental in establishing the career academy evaluation tool. Through their initiation, a scoring rubric and standards were developed. By January of 2005, the "National Standards of Practice" for career academies was created through the work of the following support and development groups: Career Academy Support Network (CASN), National Academy Foundation (NAF), National Career Academy Coalition (NCAC), National Center for Education and the Economy (NCEE), America's Choice, Southern Regional Education Board (SREB), High Schools That Work, and Talent Development High Schools/Center for Research on Education of Students Placed at Risk (CRESPAR).

Career academies continue to grow in number around the country. A study was conducted to investigate how the students' attitude and focus toward high school is altered by participation in an organized career academy. The researcher was looking for a difference in the students who participate in a career academy compared to the non-academy students at the same comprehensive high school.

Research Questions

The researcher formalized one primary question and two sub questions to answer with the study. The questions were as follows:

- How do career academies affect the focus of high school students on what and how they study?
- Are students participating in career academies more motivated to study than their comprehensive program counterparts?
- Do career academy students score higher in the academic subjects of English, math and science than their comprehensive counterparts?

Research Methodology

The researcher reviewed several studies that had been ongoing for more

than ten years in the area of career academies to determine what kind of information was currently being collected and reviewed. The researcher found that the ongoing studies being done contained information about career academy students compared to their counterparts in the same schools in regards to jobs and career paths. This researcher selected the area of student focus and motivation to determine if there was a significant advantage to the career academy program in regards to the students' overall attitude and how they learn.

The action research included a local survey to capture the junior year students' attitude and enthusiasm toward their education in high school. The survey was developed to collect data about the students' academic performance, attitude toward school, and focus on education as a whole, now and before their involvement in the career academy program. The survey also collected information regarding the students' attendance, commitment to career study, and the academic level of study in the areas of English, math and science.

The survey used one question to identify if the student was enrolled in a career academy or not. The next two questions on the survey asked the student to identify what level of science and math classes they were studying as a junior. The remaining 18 questions used a five-point Likert scale to rate the level of agreement in the topic areas of attendance, attitude, career focus, grades earned during the current year, and grades earned during the previous year.

View from Career and Technology Education

The book *Workforce 2020: Work and Workers in the 21st Century*, published by Hudson Institute, describes four future forces affecting workforce development: the pace of technological change; the global economy; the aging of the American worker; and the ethnic diversification of the labor force. How is career and technical education evolving to respond to these changes? (Bray, 2004)

The idea behind the career academy concept is one of school reform or to find a better way to prepare students for the world of work and higher education. Pierce (2001) indicated "another problem has to do with vocational education, now commonly referred to as Career and Technical Education (CTE), which has been part of the high school curriculum since the 1920's and has played an important role in preparing students for jobs. In recent years, CTE has come under criticism for not being able to prepare students for today's jobs or for not being able to document that it can do so" (p. 4).

Unlike most career and technical training, Mittelsteadt and Reeves (2003) clarified that "Most of the value-added of career academies lies not in the skill taught, but rather in the unconventional style and method of education - which emphasizes teamwork, continuous peer and teacher feedback, close involvement of parents, careful monitoring of behavior, high academic standards, and regular interaction with working professionals in a safe, personal, and highly structured environment" (p. 40). CTE teachers have much experience in working with many of these entities and should welcome the opportunity to participate in the academic development of local career academies.

Engineering, problem solving and team work are just a few of the approaches that CTE teachers have

years of experience working with. Academies are aimed at: integrating strategies for student career and college preparation; diversifying learning experiences within the classroom and through the workplace; organizing learning around a thematic, career-focused curriculum; and preparing all students for college, regardless of their college-going intentions. Orr (2005) stated another way and more to the point, "Career academies are logical places to bring academic and vocational education together." (Lewis, 2005)

The growth of the career academy programs around the country has been successful for many reasons. Most important is the fact that the CTE departments are assisting with the real world connection of the academic content. Emeagwall (2004) wrote: "Teenagers often do not make a connection between what they learn in the classroom and its application in real-world contexts" (p. 36). Furthermore, the connection of careers and the local community has always been a part of the CTE departments and continues in this reform structure.

The size of the career academy is also a strong point. Students grow very comfortable with the small group of teachers and the close planning that exists in the career academy. Because of the smaller class sizes, the students are able to receive more one-on-one time with instructors.

The data collected in this study indicated that the career academy students do score higher as a group in all subject areas measured (English, math and science). However, the data to indicate focus and motivation was inconsistent. The career academy students connect subject areas to the real world through elective courses better than their comprehensive counterparts. But the comprehensive students seem to better understand what career fields they are preparing for. The career academy students were focused on a single job compared to a career field. The career academy students indicated a higher level of motivation in attending academic classes than their comprehensive counterparts. The data collected in this study shows an average of 26% undecided on all questions addressing focus and motivation.

In Summary

The evidence shows that the career academy students have more success in connecting the academic studies to the real world through work within the elective classes. In any school system that is faced with challenges of students not being able to experience success with academics, this idea of career academies as a beneficial reform may be a good option to explore. The career and technical education department has always provided real world connection. This study makes clear the relationship of real world connection to higher academic grades. The survey data also showed that the academy students scored higher in all academic subject areas.

What does this mean for the future of education? The research makes clear that there are real benefits to reorganizing a large school house into smaller career academies. The students enrolled in the career academies not only performed better and achieved higher grades than their non-academy counterparts, they demonstrated better attendance at the same time. With the positive results shown from this study, the researcher believes that the career

academy structure of education is more than a passing fad. The evidence of success with career academies is approaching three decades in some states and more systems are implementing the change toward career academies every year.

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Back To The Future: Where Do We Go From Here?

Lee Esham

Introduction

This article is based on a research paper titled "An Analysis of Name Changes for Technology Education since 1880: Manual Training through Technology Education and Beyond". The purpose of the study was to determine the conditions, situations, events, and people that influenced name changes leading to technology education and possible future name changes.

The History

The 1800's saw the practice of handwork, or "Sloyd", as the major component of culture in Sweden and Denmark. The craftsmen developed this domestic industry into the precursor of the factory and manufacturing system that lead the way to the Industrial Revolution. This development led Uno Cygnaeus of Finland and Otto Salomon of Sweden to develop a constructive activities-based educational program for the elementary schools.

The last half of the1800's saw the Russian Imperial Technical School of Moscow replacing its apprenticeship program with a pedagogically-sequenced program of studies, employing classroom instruction separate from the construction shop. In 1876, Victor Della Vos created the Russian Exhibit of Mechanical Arts, a display of student products, for the Centennial Exposition in Philadelphia.

At about this time, Calvin Woodward of Washington University in St Louis and John Runkle of Massachusetts Institute of Technology recognized a deficiency in the educational preparedness of engineering students. The engineering programs lacked the practical hands-on experience with tools, machines and materials. The Russian Exhibit of Mechanical Arts at the Centennial Exposition in Philadelphia in 1876 provided reinforcement for their concern and became the impetus to reorganize engineering education. This reorganization integrated tools, materials and manipulative activities in higher education and the secondary schools resulting in the new system of manual training.

In the 1890's, the Arts and Craft Movement in England reached the United States where Charles Bennett instituted a new subject area concerning the arts of industry, manual arts. It included graphic arts, plastic arts, textile arts, and culinary arts. The structure was so comprehensive that many of the titles were widely accepted and used in future programmatic transitions. Bennett's philosophy was mainly concerned with education as preparation for life. He felt that all learning experiences in the schools should be directed toward the fulfillment of that most important goal.

In 1913, Fredrick Bonser and Lois Coffey Mossman established the framework for industrial arts as a separate subject at the Teachers College of Columbia University. This became the principle means of teaching and learning, and instructors were encouraged to integrate academic subjects with industrial arts. Seven subject areas evolved, including woodworking,

mechanical drawing, metalworking, graphic arts, industrial crafts, power mechanics, and electricity.

With the launch of Sputnik by the Soviets, a re-evaluation of objectives and content occurred during the 1950s and 1960s, ushering in an age of experimentation associated with the technological nature of contemporary culture. More emphasis was put on math and science. Subject areas in industrial arts expanded to include line production, transportation, industrial plastics, and electronics. The foundation was laid for the prolific development of innovative programs and the eventual curricular transformation to technology education.

Technology education, as a curricular area, has undergone numerous changes in scope, mission, and principles during its history in America. From the late 1800's to today, technology education has transitioned through methodological and philosophical changes in an effort to meet the demands of an ever-changing technological society, as well as to keep pace with industrial innovation and growth.

Other significant motivations leading to the modern era name of technology education, have included:

- William E. Warner's A *Curriculum to Reflect Technology* (1947).
- Delmar Olson's *Technology and Industrial Arts: A Derivation of Subject Matter from Technology with Implications for Industrial Arts Programs* (1957).
- Paul DeVore's Technology: An Intellectual Discipline (1964).
- The development and implementation of the Industrial Arts Curriculum Project (IACP), the American industry Project.
- Donald Maley's The Maryland Plan (1960s and 1970s).
- The 1981 Jackson's Mill Compromise where the content base of industrial arts was coupled with the focus of technology.
- In March 1985, the American Industrial Arts Association changed its name to the International Technology Education Association.
- In 1987, Michael Neden and Max Lunquist redesigned and reconfigured the teaching laboratory to reflect modular learning experiences in technology education.
- Ernest Savage and Leonard Sterry (1990) directed and edited the development of *A Conceptual Framework for Technology Education*, which helped to clarify and extrapolate the applications of the technological methods identified in the Jackson's Mill document.

In more recent times, research and publications resulting from the Technology for All Americans Project have yielded influential work in the documents:

- A Rationale and Structure for the Study of Technology (1996).
- Standards for Technological Literacy: Content for the Study of Technology (2000/2002).
- Advancing Excellence in Technological Literacy: Student Assessment, Professional Development, and Program Standards (2003).

The above brief history of events has helped to define and direct the philosophical and educational reasons for the name changes that have occurred over the years leading to technology education.

A New Name

There is discussion going on in the profession about a possible future name change once again. With a greater emphasis being placed on science, technology, engineering, and math, there

are those that argue that the name needs to be changed to include engineering along with technology. Others would like engineering or perhaps pre-engineering replace technology all together. If the new name changed to engineering and technology education, would the public understand any better what we are teaching?

Every three years ITEA develops a new strategic plan that focuses on cutting-edge issues related to the future of technology education. The title of technology, innovation, design, and engineering (TIDE) has been used in recent years to clarify technology education's intent. Even with the introduction of TIDE, which provides a new way to introduce the study of technology, the plan for 2003-2006 did not indicate there was concern for a name change at this point in time. It will be an important issue in the future and will be a topic that will foster great discussion.

In summary

The history of technology education from the 1880's manual training through today's technology education is an interesting topic. Even though much of the original historical documentation is hard to find, there is a tremendous amount of information available that documents the philosophical and educational reasons for various name changes that occurred over the years leading to technology education. It is important to realize the conditions, situations, events, and people associated with the name changes. Perhaps, in the future, the rich history of technology education will be detailed in one book to preserve its importance and plan for the future.

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Do Teachers Want Merit Pay?

John Kucharski

Within recent years, the American system of education has been the focus of increasing controversy. Public dissatisfaction with students' achievement and an apparent lack of student preparation for an increasingly technological workforce have been the catalyst for government commissions, political efforts, academic studies, legislation, litigation, and neighborhood efforts. Meanwhile, the acute and mounting shortages of qualified teachers, educators leaving the profession in record numbers, and the apparently insufficient and noncompetitive state of salaries for teachers have gained public interest as well (National Commission, 1983). Multiple efforts have been make to link the academic outcome of students with their teachers. Merit pay for teachers has gathered increased notice, in support as well as controversy, throughout several arenas – educational, academic, political and ultimately publicly, by the media.

The debate continues. Numerous school systems, committed to altering the amount as well as the method by which their teachers are paid, have switched to merit pay programs in an effort to raise student test scores, retain experienced educators, and gain new graduates to fill vacant teaching positions (Moran & Gao, 2005). As a more cautious and hesitant approach to the issue, pilot projects have sprung up (Gratz, 2005). Meanwhile, other school administrations view merit pay -- in concept and especially in reality -- with conservative skepticism or outright rejection (McCown, et al., 2004; Wheeldon, 2006).

Purpose of the Study

While the stance of numerous proponents and opponents is easily discernable, the actual support or dissention of teachers toward merit pay remains unclear. "Merit Pay: A Study of Teachers Perceptions, Attitudes and Opinions" was undertaken for the purpose of clarifying the stance of classroom teachers and discovering what factors lead to that position. Currently, no clear answers explain how teachers view the possibilities of merit pay, what factors might influence their opinions, and ultimately whether 6.2 million educators will petition for or stringently oppose such a move (U.S. Census Bureau, 2004). Obviously, the institution of a different system of pay requires a broad base and active support of all parties concerned -- governmental officials, school administration, community, parents, and certainly teachers. To impose upon educators a system of remuneration which they neither had faith in nor supported would be a waste of funds and resources. Furthermore, without teachers' active and consistent support, merit pay would be doomed to failure while compounding and intensifying existent problems – the very problems that such a proposal seeks to solve (Firestone, 1991; Gratz, 2005). Thus, a study of teachers' perceptions attitudes and opinions toward merit pay can provide valuable and necessary information.

Research Questions

Toward this objective, defining the stance of teachers toward merit pay, the researcher formulated one major research question: What are the perceptions and opinions of classroom teachers toward the institution of merit pay? Several related and influential sub questions were additionally formulated. Do teachers feel the institution of merit pay will have an impact on students' academic achievement? Do teachers feel that a merit pay system will increase recruitment or retention of teachers? Are teachers' views of merit pay influenced by their geographic location, experience or personal demographical factors?

Research Methodology

A review of the literature provided no further clarification on the position of teachers. Utilizing a double blind survey methodology, a questionnaire was constructed and target survey populations chosen for the gathering of data. Independent third parties administered, collected and tabulated the survey questionnaire, after which this raw data was communicated to the researcher. The researcher combined and compared results of three sample populations to determine the perceptions, attitudes and opinions of teachers toward the institution of a merit pay system. Further sub questions concerning factors that influence teachers' opinions were also addressed, measured and analyzed.

Research Findings

Data seemed to indicate that a substantial majority of educators viewed merit pay as fairer in remunerating teachers for their work, recognizing professional excellence and rewarding additional duties or extraordinary efforts. The majority felt merit pay was more likely to make teachers' salaries equitable and competitive to their professional counterparts in business and industry and therefore, certain to positively impact teacher retention and recruitment, while successfully attracting quality teachers to low-achieving and at-risk schools.

Conversely, an equally substantial majority of the surveyed teachers rejected any conversion to merit pay. This opposition was based on the widespread perception that merit pay created a professional environment of competition, lack of cooperation among colleagues, and limitations to a narrowed curriculum based on criteria of standardized tests. A majority of respondents perceived evaluations under a merit pay system as likely to be unfair, punitive and intimidating, while administrators would use professional assessments to practice favoritism and political patronage.

Respondents of the survey felt that no evaluation system existed to fairly assess teacher quality, achievement, and professional growth. Participants of the research study predicted a merit pay system based on student achievement scores would ultimately harm the education system by further increasing existing disparities among schools and student achievement. Finally, a majority indicated that merit pay could not be successfully implemented because adequate funding would not be allocated to support it properly.

Perhaps the most disturbing and dismal finding was the prevailing opinion of educators that no pay system was likely to improve student performance or to evaluate teachers fairly and equitably. Furthermore, surveyed teachers

resoundingly indicated that no system of pay had the capability of effectively carrying out mandates of the No Child Left Behind Law. Survey participants indicated a basic distrust in the ability of any pay system to positively impact student achievement or increase technological literacy to the level demanded by current professional, vocational and social standards.

Three major sectors of the target population failed to follow through with participation in the survey, resulting in unexpected and severe limitations on the project's resultant data. Limitations of the remaining participant population, as well as possible flaws in design of the research study itself, hindered any clear identification of geographically or demographically influential factors. It is certain the limited population of the study precludes any generalization of findings to be representative of the wider population of American teachers and no such correlation should be construed. However, representing the participant population alone, results of the research project indicated that any differences in the respondents -- namely geographic location, socioeconomic background, various grade levels taught, amount of experience, and current or previous method of remuneration -- did not seem to be determinant or influential to the teachers' opinions. Thus, opinions appeared to be similar throughout, with very little discernable deviation from the median of the entire population.

Conclusions and Summary

Based on the findings of this study, widespread conversion to merit pay at this time would be unwise and also counterproductive to any significant and lasting improvements in American education. Such a move would do little to improve professional conditions for teachers and even less would be gained toward the improvement of student achievement and technological literacy. Certainly the imposition of any disfavored pay system would have a disastrous effect on teacher morale, which seems to have hit an all time low.

The extreme difficulties encountered by the researcher in obtaining access to participant teacher populations, as well as the unexpected withdrawal of previously agreeing participant groups, clearly indicated the disapproval and subsequent obstructive measures of school administrators and supervisors. These measures on the part of school administrators ultimately imposed significant limitations on the findings and effectiveness of the research project. While these actions and conditions provides clear indications of school administrators and district officials stance toward a merit pay program, it also conclusively indicates that school administrations, supervisors and principals have a powerful and restrictive influence on teachers and their actions, perceptions and opinions. Such a situation is counterproductive to the conversion and ultimate success of any changes in pay methodology. Furthermore, this atmosphere raises previous questions and casts renewed doubts upon successful rehabilitation and continued reliance on the current and preponderantly utilized traditional systems of pay for teachers.

Meanwhile, findings of this research study reflected teachers' distrust of school administrations, lack of faith in supervisors' professional evaluations, and a widespread conviction that no significant increases in funding would likely be enacted to support changes or increases in teacher pay. It is

evident that teachers' inherent distrust of administrators, supervisors and county officials is a strongly determinant factor in teachers' rejections of merit pay.

Results of the study illustrated the apparent and widespread lack of knowledge on the part of teachers concerning various methods of pay and the benefits and weaknesses of each. For example, only 16% of participant teachers indicated that hourly pay would make teaching salaries equitable to those of other professionals in private businesses and industries. Yet the majority of other professionals in private businesses and industries are indeed paid by an hourly system. This apparent lack of knowledge and experience with various other pay systems significantly influenced the respondent teachers' perceptions and opinions of merit pay.

Of teacher populations who actually participated in the research project, the return of surveys was low. The best percentage participation of the entire research population came from the school district where the researcher teaches. This appears to indicate that a personal connection to the research project was more influential to teachers than the opportunity of expressing their opinion ("being heard") or proactive participation for improvement of pay. It became readily apparent to the researcher why commercial scientific studies often advertise rewards (either in goods, services or cash) in return for individual participation in studies.

Recommendations

In light of the findings of this research project, there is a prevalent and obvious need for teachers to be further educated concerning the nature of various pay systems, their differences, similarities, weaknesses, and strengths. Without a stronger knowledge base of all pay methods, teachers will be unable to make an informed or qualitative choice of any one over all others. More apparently illuminated by the research project is the need for study and scrutiny of school administrations' influences on teachers and their choices, as well as any other factors limiting or influencing educators' ability to make choices relevant to their career, lifestyle and future.

Further studies of merit pay should be carried out, as should studies of all other methods of pay related to school systems and teachers. In future studies, every effort should be made to obtain widespread representation of various regions, demographic groups, and teachers. A particularly valuable research project would be one studying differences of opinions of teacher pay methods between administrators, supervisors, county officials, teachers, parents, and students. It would be valuable to learn how parents and students feel about a possible connection between student achievement and teachers' pay.

Teacher evaluation systems should also be studied thoroughly and revamped to reflect peer and parent input. Regardless of what pay system a teacher is employed under, it is neither fair or effective when supervisory observations and evaluations are subjective, influenced by personal preferences, beliefs, and outcomes predetermined by a set pay scale and/or budgetary constraints. Rather, as is common in business and industry, professional educators' evaluations should be tailored to evaluate professional growth according to clearly stated standards, criteria, and attainment of common goals.

Lastly, there is a need for further

studies of student achievement - if and how it is indeed affected by the method by which a teacher is paid, what factors are most influential on students' achievement, and what part of those factors teachers could or should be expected to impact.

We, as a nation, must realize that two separate issues exist -- teachers' pay and student achievement. While these issues may or may not be jointly addressed, the outcome is dependent upon the conditions and circumstances by which such an effort is enacted. Regardless, methods of teachers' pay and student achievement may be mutually exclusive issues. Utilizing one to determine the other may result in the sacrifice of expediency, accuracy and attainment of success in either area.

Student performance and achievement are indeed in urgent need of improvement. Schools are producing our future. A person suffering a heart attack does not call an ambulance to place limitations, conditions and restrictions on the paramedics. He does not then arrive at a hospital to insist upon haggling with the doctor over the price of life-saving surgery. Few quadruple bypass survivors boast at the cheapness of the surgeon or the strip-down model operating room. By the same token, we cannot educate our future populations at a bargain basement price and expect a fine quality, lifetime warranted product. If we spare no expense, deny no effort, insist upon the best, encourage and support, we will receive in accordance to the price we pay.

It has long been known that no teacher ever entered the profession with the intent of gaining great wealth. Thus, utilizing merit pay to increase student performance is flawed in its assumption that teachers do not teach well because they are not paid well. However, like the previously mentioned cardiac patient, we are beyond the time, place or luxury of haggling over the price of repairing damage inflicted by years of neglect, misguided intentions and temporary fixes. After years of teaching while living on a limited budget, experienced master teachers are retiring. New teachers, in the face of insurmountable odds, enter the profession with philanthropic intent, only to leave a short time later, disillusioned and dissatisfied. Colleges and universities are running out of replacement candidates. College graduates are watching teachers drive out of the parking lot in smoking, rusty jalopies while business professionals pass by sparkling Bentleys.

The time has come. You are the surgeon. What will it be?

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The Four Period Day: Good or Bad for Technology Education?

Chris Scholz

Introduction

The traditional high school scheduling structure has remained essentially the same for most of the 20th century, with the exception of some experimentation with flexible class periods during the open education period in the late 1960s and early 1970s. In 1959, just prior to this period of experimentation, J. Lloyd Trump proposed eliminating the traditional high school schedule and instituting classes of varying lengths in accordance with the instructional needs of students. The Trump Plan allowed for a class to meet for a 40-minute lecture, a 100-minute lab, and a 20-minute help session each week, whereas other classes could be short periods of 20 or 30 minutes. Trump encouraged teachers using his design to experiment with a variety of instructional strategies. (Queen, 2000)

Student schedules have often been based on tradition rather than on proven educational merit. In 1990, Michael Fullan reiterated the idea that the traditional high school schedule had become a powerful myth, ceremonially adopted whether or not it was efficient or effective. Even today, despite awareness of problems with the traditional schedule, the power it exerts causes some educators to resist any change in the schedule and others to choose to return to an unblocked format (Fullan, 1990).

In Harford County, the schedule had been a six period day with each class period being 55 minutes long. In 1986, the Harford County Public School System changed to a seven period day. Teachers taught five classes and had a duty period and a planning period. In 2003, it was decided that the school system had too many different schedules at the eight different high schools. They would have just one model starting with the 2006-2007 school year, that of a four period block with A/B days for most content areas. Technology education was taught on the A/B day rotation.

Purpose of Research

A research study was conducted to provide necessary background information on the history and purpose of scheduling classes in the high schools. The following research questions were examined:

- What are the initial perceptions of high school technology education teachers in HCPS toward the implementation of the four period block schedule (FPBS)?
- Has the FPBS had any effects on the technology education classes in Harford County Public Schools?

The purpose of this study was to investigate the effects and opinions of teachers in Harford County, Maryland on the implementation of the four period day. The study reviewed the historical and current literature, developed a twelve item survey instrument, compared the results, and summarized the findings. The survey was distributed to teachers and administrators at all eight high schools of Harford County Public Schools. The research was used to gain an understanding of the effects of the

change in period length and number of meeting days during the week in the first year of implementation on the high school's educational setting in technology education classrooms. The findings were used to determine the advantages and disadvantages of the new period structure for technology educators and suggest ways to better implement the new system.

Advantages and Disadvantages

The review of the literature collected showed that there were both positive and negative opinions for the four period block schedule.

Some of the advantages found by Queen and Isenhour (1998) were:

1. Lengthened classes reduced the amount of instructional time spent on classroom administration.
2. Lessons could be extended and maintained with greater continuity.
3. Discipline improved in direct response to the reduced number of class changes.
4. A less fragmented schedule allowed the students to focus on fewer courses at one time.
5. Teachers benefited from additional planning time.
6. When absent, students had fewer courses in which to make up work.
7. Students who needed remedial assistance or who failed a course during the first semester had the opportunity to repeat the course during the second semester.
8. Advanced students had the opportunity for acceleration and enrichment.
9. Most schools using block scheduling were able to offer a wider variety of elective courses.
10. Additional class time enabled teachers to engage students in interactive learning.

Some of the pitfalls mentioned were best summarized by Jeff Lindsay (2006):

First, there is the fundamental problem of adolescent attention span. Making a class twice as long usually does not enable twice as much material to be covered. Many teachers are familiar with the short attention span of teenagers. The problems are especially severe with learning disabled kids. When a 50-minute class becomes a 90 or 100-minute class, what happens? To maintain attention, less instruction and more "fun" activities are needed. This "transformation" seems to be the greatest thing about block scheduling in the minds of some proponents, but in practice it means a watering down of course content. Proponents utter the empty slogan "less is more," meaning that less is covered but more is learned, but they are unable to substantiate such rhetoric. Another slogan states that block scheduling helps to eliminate "the sage on the stage" in favor of "the guide on the side." But the "teacher as facilitator" concept rather than "teacher as instructor" is another unproven concept which, in fact, is at odds with the largest educational study ever conducted, Project Follow Through. Project Follow Through remains today the world's largest educational experiment. It began in 1967 as part of President Johnson's ambitious War on Poverty and continued until the summer of 1995, having cost about a billion dollars. Over the first ten years, more than 22 sponsors worked with over 180 sites at a cost of over $500 million in a massive effort to find ways to break the cycle of poverty through improved education (p. 3).

In summary

The survey revealed that there was a difference of opinion on different aspects of the four period day. However, in general, technology education teachers favored this type of scheduling. The four-period/block schedule has been based on the theory that having students move from class to class less often will allow more time in class. While this has proved true, the teachers are having to face new challenges to keep students on task, as well as making up work when missed.

Technology education classes benefit from longer class periods. However, this must be coupled with more varied instructional strategies to keep students on task, as well as adequate planning time and training. This researcher believes that there are many good things that can be accomplished with a block schedule in technology education classes provided class size is maintained at state recommendations and funding is provided for the additional students being taught.

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The Technology Education Leadership Project: A Revisit

Dennis Soboleski

In 1998, the University of Maryland Eastern Shore (UMES) was awarded a National Science Foundation (NSF) grant to create a program that would enhance technology education throughout the state of Maryland. The program was called the Technology Education Leadership Project (TELP). The primary goal of TELP was to provide training to a representative group of approximately ninety (90) teachers in content-based activities that applied mathematic and scientific concepts to real-world problems and to cultivate future leaders in technology education.

Over a three-year period, the teachers received training at four, one-day sessions during the school year. There were also two-week intensive training sessions held on-campus at UMES for two weeks each summer. Teachers received training resource binders and were assigned hands-on projects during each phase of the three-year project.

With the goal of state-wide consistency in mind, at completion of the second year, the teacher trainees became trainers, and were required to provide local training in their school system to an additional twenty (20) teachers. Thus, the teachers being trained grew from the original ninety to a few hundred. Some smaller school systems, with fewer teachers, organized regional training by combining two or more systems.

The TELP program enabled a consistent curricular focus statewide, and more effective instruction. Teachers could travel from one end of the State to the other, and essentially see the same type of activities and content being taught. A secondary focus of the TELP project was to produce new leadership for technology education in Maryland. A component of each training session was focused on educational leadership.

The TELP principle investigators were Mr. Robert Gray and Dr. Leon Copeland. According to Copeland and Gray (2003):

The unique and innovative aspect of the TELP project was instruction based on the core technologies and the utilization of six teaching/learning strategies emphasizing student problem solving . . . Training content includes the core technologies, which are the building blocks of all technology systems: (1) mechanical technology, (2) electrical technology, (3) electronic technology (4) structural technology, (5) fluid technology, (6) optical technology, (7) thermal technology, (8) bio-related technology, and (9) materials technology. Knowledge related to the core technologies provide students with an understanding of (a) common components, (b) basic systems design, (c) simple controls, (d) system performance evaluation, (e) science concepts applied, (f) mathematics applications to measure, analyze, describe and predict, and (g) safety practices for interacting with technology systems.

The second innovative and unique feature of this project was instruction on

six teaching/learning strategies that enable students to achieve the goals of technology education. They include: (1) ingenuity challenge, (2) modular technology activity package, (3) topic investigation, (4) engineering design and development, (5) product generation and (6) research and experimentation. The instructional strategies have proved effective in Maryland in enabling students to achieve the goals of technology education. They require students to design, construct, test, evaluate, measure, solve problems, plan, calculate, research, investigate, and report. (p. 5)

With hundreds of teachers throughout Maryland receiving identical training over a three year period (1999 – 2001), the enduring impact of this training needed to be determined. What were teachers teaching several years after the TELP project?

This research project studied the enduring effects of the Technology Education Leadership Project on the primary teachers involved, two years after its completion, as reflected in classroom activities and leadership involvement.

Research Methodology and Questions

The initial task of this research study was to choose research questions that were specific enough to formulate a framework for the study. The concern was also to pose questions that would result in data that will assist the principle investigators in applying for future professional development grants.

1. What were the enduring curricular effects of the TELP program in Maryland middle and high schools from teachers completing the TELP program?
2. To what extent were TELP participants involved in local, state and national leadership activities?
3. Would original TELP trainees be willing to participate in future professional development opportunities?

Data Collection

A survey was designed to gather data from teachers to indicate the level to which they are currently using information they gained from the TELP project in the classrooms. A five point Likert-type scale (survey) was developed that provided answers to the research questions posed. The data collected was first examined in a general fashion to determine which of the core technology content organizers were currently being taught. Also examined was the extent to which the core technologies were being taught, which of the six teaching/learning strategies were used and to what extent, and to determine the level of participation in leadership activities by the teachers surveyed.

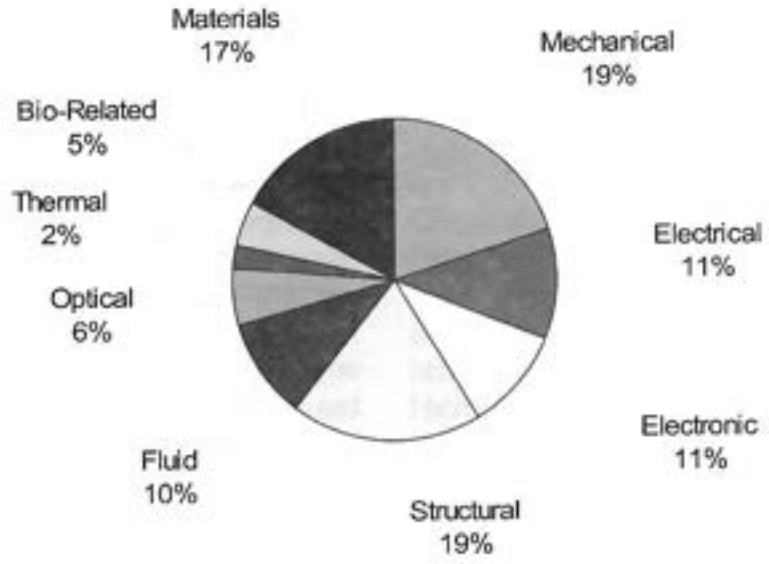
The data collected showed which core technologies and teaching/learning strategies were being currently used the most and the least. Although the data showed quantitative results on the 1 to 5 scale, the final averages calculated for each statement indicated only general trends. Statistical analysis was used to summarize the collected data such as means and percentages. Therefore, the conclusions were primarily qualitative in nature, based upon the trends reflected in the data showing how often, in general, TELP activities were still being used in Maryland technology education labs.

Findings

The data reflected that materials, structural and mechanical technologies

were by far the most used as content organizers. Electrical, electronic and fluid technologies were about equal, but were taught about half as much as the three technologies of materials, structural, and mechanical. Optical, bio-related and thermal were the least taught by the survey participants, with thermal being the least overall. Chart 1 shows the percentage of use of each core technology when compared to each other.

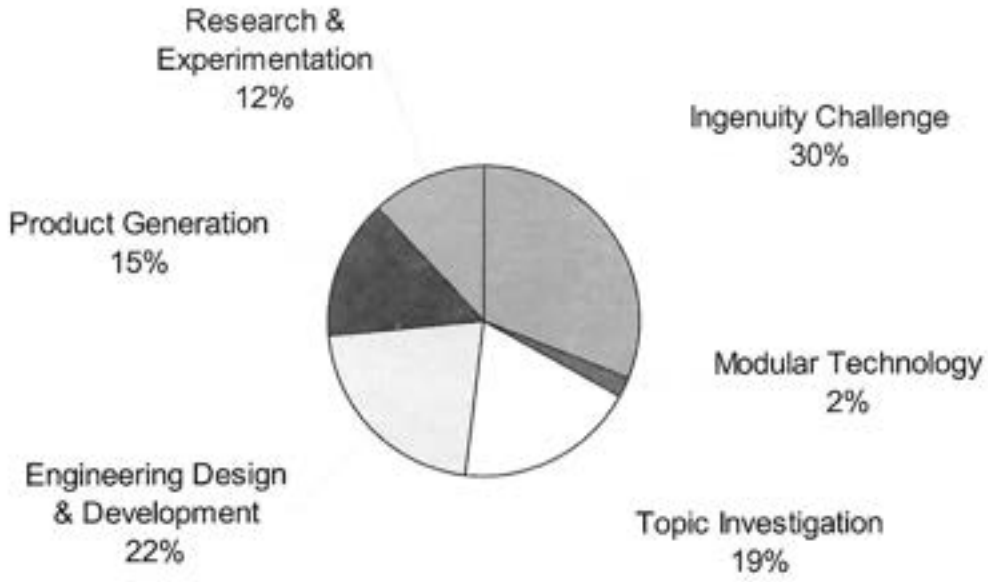
Chart 1 Use of Core Technologies



The Six Teaching/Learning Strategies

Chart 2 displays the usage of each of the six teaching/learning strategies taught during the TELP program. The data reflected the ingenuity challenge method to be the most often method used for teaching technology education content by the survey participants. Topic investigation and engineering design and development were the second most used methods. Product generation and research and experimentation were the third most used and the modular technology method was used least.

Chart 2 **Use of Teaching / Learning Stategies**



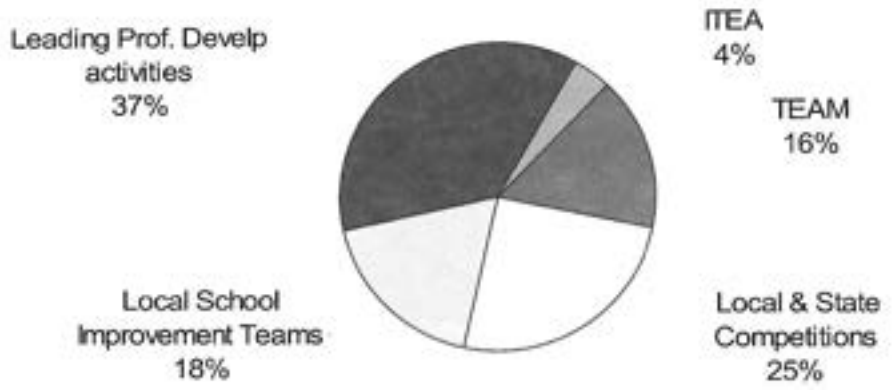
Leadership Involvement

Chart 3 reflects the survey respondents involvement in leadership activities. The data provided related to the third research question: "To what extent were TELP participants involved in local, state and national leadership activities?" The data reflected that most of the survey respondents were involved more in leading professional developing activities than any other category. Typically these activities were at the school or local level, but could also reflect state level leadership by leading a workshop session at the annual state technology education conference. The data did not make this distinction.

Get Involved in Your Professional Organization

Join your professional organization, the Technology Education Association of Maryland, and get involved. Attend the Tech Expo in October, submit articles to the TEAM Journal, participate in the Maryland Engineering Challenges, attend TEAM executive board meetings, become a member of the TEAM executive board, check out the TEAM website, and submit nominations and attend the TEAM awards dinner for outstanding Technology Education teachers and programs. Check out our website at www.techedmd.org.

Chart 3 **Involvement in Leadership Activities**



Conclusions

The findings of this research project showed that there were positive enduring effects of the Technology Education Leadership Project among the initial teachers who participated in the program over three years. Most of the nine core technologies were being taught in classrooms, with only three having lower usage: optical, bio-related and thermal technologies. It appeared that the trained teachers were also using five of the six teaching/learning strategies, with the modular approach being rarely or never used. Most of the surveyed teachers have been involved in some sort of leadership activity. Nearly every teacher responding indicated that they would participate in future state-wide professional development programs.

As a result of this study's findings, it would seem that more teachers need training in some of the less tangible core technologies. Each of the nine core technologies has received equal emphasis in the Maryland Technology Education Content Standards. Additional training in thermal, optical, and bio-related technologies seem to be needed.

The six teaching/learning strategies seemed to be understood and most teachers indicated equal use among five of the six strategies. The modular approach received the lowest rating. Because of the high interest level among the teachers surveyed to participate in future professional development programs, it is recommended that the feasibility of such professional development programs be investigated and implemented.

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Dennis Soboleski is the Supervisor for Technology Education and Pre-Engineering programs in Howard County Maryland. He previously taught high school technology education for 17 years and served on the Executive Board of the Technology Education Association of Maryland for five years.

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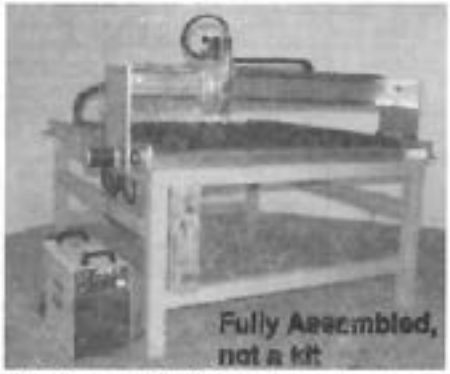

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Time	Opening Ceremony	Room
7:30 – 9:00	**Ballpark Gates Open: Registration**	
9:00 – 3:00	**Vendors Exhibits Open**	BMI
8:00 – 8:40	**TEAM Business Meeting**	Decker
	Warm-Up and First Pitch	
8:45 – 9:15	**"The Importance of Teaching Engineering Concepts in School"** **Keynote Speaker** Suzanne Jenniches, Vice President and General Manager, Government Systems Division, Northrop Grumman Corp.	Decker
	Fourth Inning	
9:15 – 10:30	**Panel Discussion on Implementing the Maryland VSC** **Session I** This panel discussion will give participants a middle school and high school perspective on implementing the VSC. Local Technology Education supervisors and classroom teachers will present and field questions. *Manager:* Dr. Gerald Day *Coaches Panel*: Ed Ball - Montgomery County, Ken Smith - St. Mary's County, Charlene Bonham - Frederick County	Decker
9:45 – 10:30	**Exploring College Scholarships for Engineering and Technology Students** This presentation will focus on the scholarships available from local, state and national colleges for students. *Presented by*: Ken Hadfield *Audience* – High School Staff	11
9:45 – 10:30	**Vendor Demonstration** - AMTEK **Improving Academic Success with SolidWorks** Learn how students can better grasp STEM concepts while learning the industry-standard SolidWorks software. *Presented by*: Rich Sykes *Audience* – All School Staff	1 Liberty Room
9:45 – 10:30	**Google SketchUp** A new "easy to use" 3D modeling and CAD program that is free for students, instructors, and schools. *Presented by*: Bill Weber *Audience* – All School Staff	4 Fireplace Room
9:45 – 10:30	**Packing Up For The Moon – STEM Design Challenge** This standards-based unit is based on NASA's Vision for Space Exploration. Design and construct a lunar plant growth chamber. *Presented by*: Aaron Gray *Audience* – Middle School Staff	9

Time	Event	Room
9:45 – 11:30	**Teacher In-Service Program (TISP): Part I** A set of 2-hour enrichment projects for all ages that are fun to do yet meet curriculum requirements. Two of the projects will be demonstrated. **Teacher In-Service Program (TISP): Part II** Brief Overview of the Engineering Challenges. *Presented by*: Bill Semancik, Mike Shealey, Neville Jacobs	8
9:45 – 10:30	**What's Next After Foundations of Technology?** What would you get if you took Unit 3 (Engineering Design) of Foundations of Technology and stretch it into a full-year advanced technology education course? The answer is the CATTS course entitled Technological Design. *Presented by*: Bob Gray *Audience* – High School Staff	7
9:45 – 10:30	**Launch Straw Rockets and STEM in your Class!** Launch your way into integrating Science, Technology, Engineering and Math using low cost, straw rockets. *Presented by*: John Smucker *Audience* – All School Staff	12
10:30 – 11:30	**Panel Discussion on Implementing the VSC** **Session II** This panel discussion will give participants a middle school and high school perspective on implementing the VSC. Local Technology Education supervisors and classroom teachers will present and field questions. *Manager:* Dr. Gerald Day *Teams*: Mike Gray, Ted McNett, Kim Pelle - Carroll County Mike Weglein, Ralph Olson, Chris Putnam - Baltimore County Dennis Soboleski, Aaron Gray, Eric Cullings - Howard County	Decker
	Fifth Inning	
10:45 – 11:30	**Vendor Demonstration:** Diversified Educational Systems Attendees will benefit by gaining knowledge of an outstanding warranty, unmatchable features, and educational pricing of Festool precision hand power tool products. *Presented by:* Ray Lanham *Audience* – All School Staff	1 Liberty Room
10:45 – 11:30	**Engineering Challenges Aligned to the New VSC** Help us align the Maryland Engineering Challenges to the curriculum in your county. These standards-based activities increase student interest in your courses and get your whole school excited about Technology Education. *Presented by*: Paul Wiedorn *Audience* – All School Staff	12
10:45 – 11:30	**CCBC Introduces AAS Degree in Engineering Technology** CCBC's new Engineering Technology Degree enables students to acquire an associate's degree and move directly into the civil or mechanical engineering field as an engineering technician. *Presented by*: Laura LeMire *Audience* – All School Staff	6
10:45 – 11:30	**CATTS and TEAACH are a Winning Team** This presentation will describe the TEAACH partnership program and how it helps deliver a CATTS lesson on fluid technology. *Presenters*: Ruth Akers, John Lindley, David Schultheis *Audience* – Middle School Staff	11

Time	Event	Room
10:45 – 11:30	**CATTS Real World Laser Technology in the Classroom** A complete laser lesson using small group rotations. Walk away with free plans, PowerPoint, WebQuest, worksheets, plus additional optical technology computer activities for further exploration. *Presenters*: Vivienne Werner, Patty Severn *Audience* - High School Staff	4 Fireplace Room
10:45 – 11:30	**Engineering byDesign™ - A Standards-Based National Model** Learn first-hand how Maryland teachers, schools and school districts can implement the Maryland VSC using a national model. Learn why starting with standards and then developing lessons and activities help students to do better on high stakes assessments. *Presented by*: Barry Burke, ITEA *Audience* – High School Staff.	7
11:30 – 12:30	**Lunch, Door Prizes**	Wagon
	Sixth Inning	
12:45 – 1:30	**Vendor Demonstrations** - Cadsoft Corporation **The Latest in Innovative Tools for Architectural Drafting Education** Cadsoft Corp., a longstanding Autodesk@ Developer for 3D architectural programs for AutoCAD@, has made its award-winning Envisioneer™ 3D Architectural, Interior and Landscape Design software available to schools. *Presented by*: Chantale Pitts *Audience* – All School Staff	11
12:45 – 1:30	**Vendor Demonstration** - AMTEK **Improving Academic Success with SolidWorks** Examine how students can better grasp STEM concepts while learning the industry-standard SolidWorks software. *Presented by*: Rich Sykes *Audience* – All School Staff	1 Liberty Room
12:45 – 1:30	**INSPIRES Curriculum:** **Engineering in Health Care, Flight & Energy Solutions** The INSPIRES curriculum incorporates hands-on activities and inquiry-based design learning which targets ITEA standards. Featured modules include: Engineering in Health Care, Flight, and Energy Solutions. *Presenters*: Taryn Bayles, Dr. Julia Ross *Audience* – High School Staff	8
12:45 – 1:30	**Foundations of Technology On-line** To meet the resource demands for the basic high school credit, Montgomery County Public Schools has piloted its 8 week hybrid course this past summer. Learn all about it! *Presenters*: Ed Ball, Steve Mikulski *Audience* – High School Staff	3
12:45 – 1:30	**Vendor Demonstration** - Diversified Educational Systems **Chief Architect Professional Design and Drafting Software** An introduction to Chief Architect software - The complete solution! 3-D models, interior design, blueprints, and layouts. Easy and efficient planning. Over 18,000 library items available. *Presented by*: Randy Dotson *Audience* – All School Staff	9

Time	Event	Room
12:45 – 1:30	**Safety and Liability in the Technology Education Laboratory** This presentation will focus on safety practices and liability issues in the Technology Education laboratory. *Presented by*: Karl Gettle *Audience* – All School Staff	6
12:45 – 1:30	**Launch Straw Rockets and STEM in your Class!** Launch your way into integrating Science, Technology, Engineering and Math using low cost, straw rockets. This is a design, build, test, and evaluate activity. *Presenters*: John Smucker, Tom Miley *Audience* – All School Staff	12
12:45 – 1:30	**Delivering Standards-Based Instruction: Lessons Learned in the Classroom** High school teachers will share the positive aspects and the challenges that they have encountered in delivering standards-based instruction to their students. Time will be open for discussion with the audience. *Manager*: Douglas Handy *Audience* – High School Staff *Coaches Panel*: Ruth Akers, Sharon Ball, Chris Gray, Paul Wiedorn	7
12:45 – 1:30	**Maryland Robot Challenge** This demo will give students a basis from which to decide whether they would like to be an engineer. Project management can be simulated with a real-life engineering project. See how students can absorb skills by doing, gain confidence, and improve essay writing and presentation skills. Discussion about the Teacher In-Service Program (TISP) sponsored by the Institute of Electrical and Electronic Engineers (IEEE). This program offers over 40 technology projects for all ages that meet Maryland curriculum requirements, and which can be offered at very little cost in your schools. *Presented by*: Jacobs Neville *Audience* – High School Staff	Decker
1:45 – 3:00	**Game Wrap-Up** After-game wrap-up session, grand prize raffle, and extra innings if needed.	Decker

Next Year's Schedule

See you next year for the completion of the ballgame: Innings 7, 8, and 9. TEAM is looking for new managers, coaches, and players. Please consider being a player - presenter at next year's ballgame. Submit your contract on the TEAM website - www.techedmd.org. See you next opening day, October 17, 2008.

Obtaining a Computer Lab on a Tight Budget

Ariston DeLeon

Introduction

One of the biggest issues that technology education teachers constantly face is making sure that they have the best curriculum possible. But with a very tight budget, it's often hard just to survive a single school year. Budget crunches and law changes make it harder and harder for technology education teachers to make sure that they have all the right tools to make their lessons work.

As a teacher in my 6th year, I have learned how to make my budget work for me. There are a number of resources that are out there that many teachers know little or nothing about. This article will give you valuable resources that can help you start and run a technology education computer lab on a shoe string budget.

Free Computers

Technology education is constantly changing. One of the best ways to keep students interested is to teach using multimedia. Computers provide the easiest ways to create a multimedia experience. Computers can be used more than just for basic Computer Aided Drafting and Design (CADD). They can also be used for documentation and research. You're probably saying to yourself, how am I going to get computers with my limited budget? If I'm lucky, I can buy one computer a year. There is a better solution than just waiting for funding to come.

What many teachers do not know is that you can get a classroom full of computers for free! "How do I get free computers?" you ask. Simple. It is a program through the government called Computers for Learning (CFL). CFL gives surplus and excesses computers to nonprofit organizations like schools and churches.

Every four years, various government agencies replace their computers. Because there are so many agencies, there are warehouses full of computers that would be destroyed if they are not donated. Disposal officers do not want to just throw these computers away. They are required by law to give them to schools. This allows them to use the donations as a tax write off and also to make sure they are put into good use.

Below is a description of their program from their website.

Computers for Learning (CFL) places computers in our classrooms and prepares our children to contribute and compete in the 21st century. This CFL website connects the registered needs of schools and educational nonprofit organizations with computer equipment made available free of charge from government agencies and the private sector.

First check with your principal to get approval, then go to their website *http://computers.fed.gov* to register your school. Once you have registered, you will fill out a request for the number of computers, monitors, scanners, printers,

and laptops you want to obtain.

If you browse around the CFL website and take a look at other schools request, you will notice that not many schools have had their requests fulfilled. Some teachers wait for years before they even receive a phone call from an agency. But there is a secret to get computers in less than a week after you register.

The best approach is to be proactive about contacting people. Each agency has a disposal officer whose sole job is to make sure that computers come in and out of their agency. These people are always on the look out for non-profit organizations to give their computers to. Only a very few of them actually go to the CFL website to find requests. The key to getting computers is to e-mail them one by one but use a template to customize it. First introduce yourself and what you do. Then explain to them that you need computers and about what you plan to do with them. Make the letter generic but at the same time easy to personalize.

Once you have made the generic letter, go to this website and print out contact information of agencies that are near your school: *http://www.gsa.gov/Portal/gsa/ep/contentView.do?P=FBC1&contentId=9727&contentType=GSA_BASIC*. There is a list of disposal officers online through the Government Services Administration (GSA). This list has all of the agencies and those who are in charge of the disposal process. Below is a sample of the contacts.

Administrative Office of the U.S. Courts	
Denise A. Marks Facilities Program Analyst Space & Facilities Division Administrative Office of the United States Courts One Columbus Circle, NE Suite G-100 Washington, DC 20544	**PH:** (202) 502-1361 **EMAIL:** denise_marks@ao.uscourts.gov **FAX:** (202) 502-1488
Central Intelligence Agency	
Ron Reese GSA Representative Central Intelligence Agency Building B, Loisdale Road Springfield, VA 22150	**PH:** (703) 874-6208 **FAX:** (703) 971-1923
Comptroller of the Currency	
Andre Wilson Currency Property Custodian Real Estate & Capital Assets Comptroller of the Currency Mail Stop 4-12 250 E Street, SW Washington, DC 20219	**PH:** (202) 874-4985 **EMAIL:** andre.wilson@occ.treas.gov **FAX:** (202) 874-5625

To guarantee computers, you must individualize each e-mail. After you have sent all e-mails, within a matter of 24 hours you will have disposal officers contacting you. In a span of 2 weeks I had 10 agencies contact me asking me if I was interested in picking up some computers. Eventually, there was a point when I had to turn away potential donors.

I have picked up computers from this program and the computers are in excellent working condition. These computers are used, and have cosmetic flaws, but they are fully functioning. The biggest task is picking the computers up. It is important to use a moving truck to transport the computers.

Another issue that must be understood is because most school systems do not like donated computers, these computers are not maintained and supported by the school system. You will have to find personnel and resources within the school system to do that if you do not have the expertise yourself.

Now that you have free computers in your lab, what now?

If you were to go out and buy a

copy of Windows for 30 computers, it would cost you at least $150 a copy, which would come to about $4500. So what's the point in accepting donated computers if you cannot even put an operating system on them? Well there are two options to solve this problem. The first solution is to use Linux as your operating system.

Linux is an open source operating system which means it is free to install and use. Linux is not a very popular operating system, and it does take a little bit of time to understand how the interface works if you are not too familiar with the operating system. There are other drawbacks such as the lack of software available, and little or no support.

The second option is a program through Microsoft called Fresh Start. The program gives schools free seat licenses of Windows 98 SE or Windows 2000. They also provide support to schools. All you have to do is register at http://www.microsoft.com/education/freshstart, and within a week you will receive a small package that has an installation CD of Windows and a license number. Because windows is the standard in operating systems and is the most used operating system in the world, students are more familiar with the interface. Most software that is out there is compatible with Windows. One of the biggest drawbacks to Windows is the possibility of viruses infiltrating your network, but there are some free anti-virus software available.

Free Software

Now that you have computers with Windows installed in them, what now? This section will give you a list of free software that you can install and use in your classroom. It is important to remember that there are some school systems that insist you to go through an approval process for your software.

CAD Software

Pro/Desktop: Pro/Desktop is a three dimensional modeling software that is provided through PTC. To receive the software you must go through training and complete some basic assignments. After you have completed the requirements, you will receive a 300 seat site license that students can take home for free.

Pro/Engineer: Pro/Engineer is one of the biggest CAD programs. It is becoming an industry standard in many engineering firms because of its versatility and its ability to create simulations and diagnostics using complex analysis. Just like Pro/Desktop you have to go through training to receive the site license. And with both software Pro/Desktop and Pro/Engineer, you will receive a lifetime of updates and supports when you complete the trainings.

Building Homes of Our Own: Homes of Our Own (HOOO) is free software that simulates the entire process of building a house, starting from picking out land, going through permits, hiring contractors, all the way to customizing furniture. It is a complete simulation that is through the National Association of Home Builders. To receive the software, register on their website and within a couple of days, you will receive a CD complete with lesson plans and handouts.

Network Software

Virtual Network Computing (VNC): One of the hardest task when

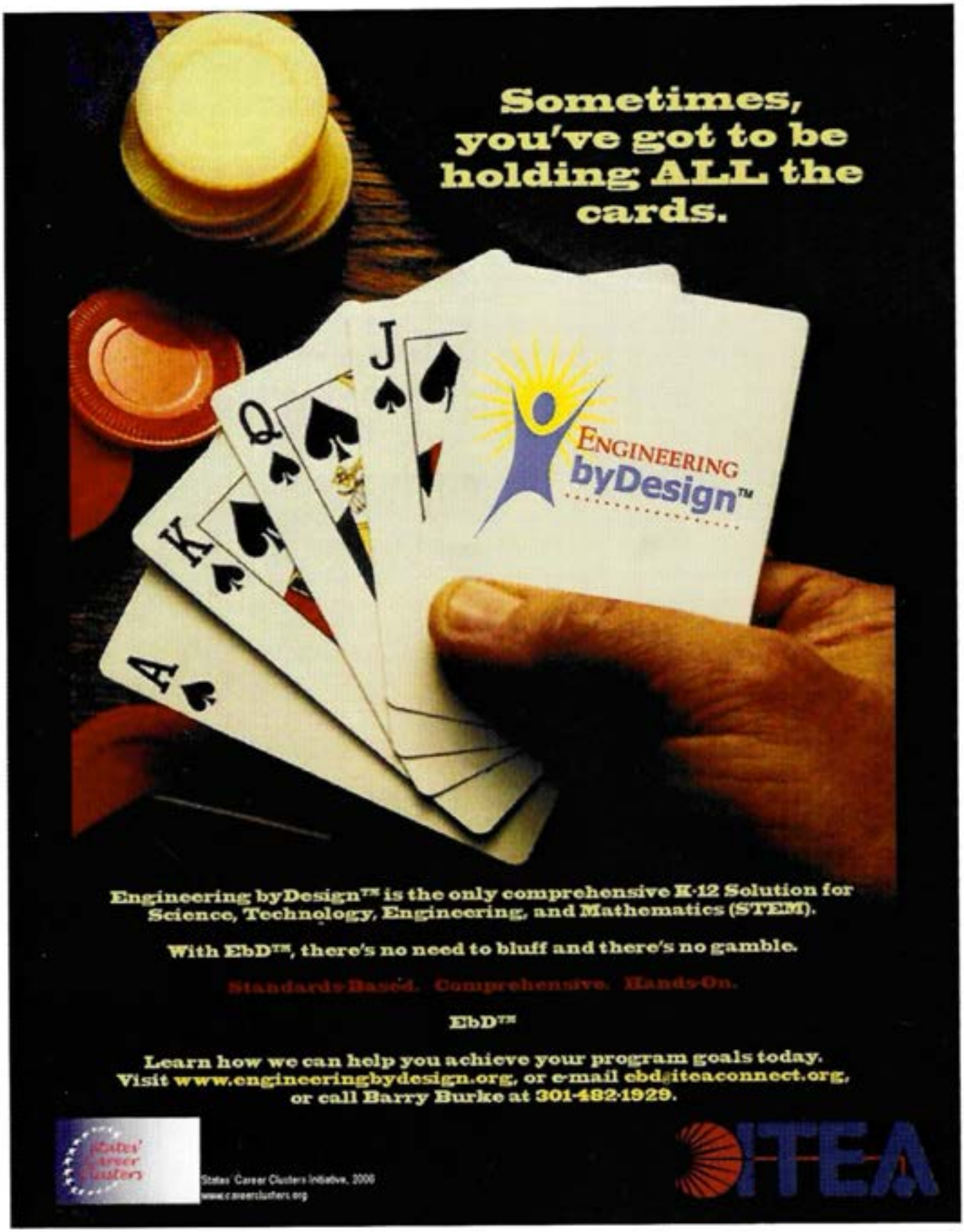
having students work on the computer is making sure that they are on task. There are students who browse around the computer, and change settings without you knowing. Also, if your lab is spread out, it is hard to help students out if they are stuck on something. You spend more time walking around the classroom than you are helping students. The solution is Virtual Network Computing (VNC). VNC is open source software that is free to use. VNC allows you to see what the students are seeing by displaying their screen onto yours. It also allows you to take full control of their computers. So if there is a student that needs help with their work, you can help them from your computer.

Summary

A computer lab should not be something teachers have to wait and beg for. There are warehouses full of good computers that are just waiting to be claimed and used. With some research and hard work, you can have a lab up and running. With computers as common tools in many homes and businesses, it's important to teach students with something they are familiar with. Computers have made education a dynamic environment where students can find information through endless amounts of websites, see multimedia, create documents, and design projects.

Author

Ariston DeLeon is a Technology Education teacher at Clarksville Middle School in Howard County.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