

An Introductory Parable
to
SOAR: Students Own All Resources
in a Knowledge Worker-model
Digital Nervous School System

Erika, a 5th grade student has just put down "The Giver", by Lois Lowry and logs into <http://digitalclassrooms.com> to take the content test online. After clicking the submit button, her web-based results are updated to her digital individualized education plan (DIEP). Erika and her support team (i.e., parents, teachers, administrators, researchers) have 24X7 password-protected access to her progress. Erika's teacher, Mr. Donahue, accesses her DIEP to guide her next steps. He sees that she is ready to present a synopsis of the story to the class. She practices the presentation with him one-on-one until they feel confident that it will be a good one. Erika invites her father to attend the presentation and Ms. Wilson, the building principal, shows up as well. Her speech goes well and everyone in the team gives her a round of applause.

By the way, Erika is a homeschool student from Montana, her father is working on an jack-up oil rig in the Persian Gulf, Mr. Donahue is a online educator living on the beach in México, Ms. Wilson works in an inner city elementary school that has partnered with digitalclassrooms to improve the school literacy program and we forgot to tell you that she invited Ms. Lowry, who also logged on to see her book being presented by Erika as well.

SOAR:
Student Ownership of All Resources
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by

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ABSTRACT

Business has, historically, been ‘The Model’ for many educational reforms. To increase student achievement schools today must adopt best practice from the global business leaders and leverage the related technology that drives these successful companies into the school community.

Challenge

Moving from the current teacher/student relationship as ***Boss/Task Worker*** business model (circa 1900’s) where you will find today bored students, burned out teachers, drugs, bells, 40 minute class periods, desks in neat rows, violence, and increasing amounts of negative chaotic activities to the ***Educational Consultant/Knowledge Worker*** business model (2000) found at leading companies where you will observe flow, choice, personal responsibility, milestones, multimedia assets, spontaneous human interaction with knowledge resources is a logical direction to insure that students achieve what is desired from a professional standpoint as well as from a humanistic approach to education.

Four Points to Ponder

The purpose of SOAR is to increase student achievement through tailoring individual student interest to local, state, national and global education standards and benchmarks integrated in a core curriculum by leveraging existing computer applications into the classroom.

This new structural framework, using a *Digital Nervous School System* in school communities, is to include:

1. Student as *Knowledge Worker*, who creates and follows her to-do list seamlessly interwoven with required standards and mandates in an integrated core curriculum.
2. Teacher as *Educational Consultant*, who acts as a ‘Guide by the Side’, not a ‘Sage on the Stage’; ready to assist and encourage students individually and in teams to achieve milestones with success.
3. An integrated digital toolset that seamlessly connects to disparate document-storage learning systems for *Just-In-Time/Speed-of-Thought* (JIT/SOT) educational processes.
4. JIT/SOT student assessment which lets her, the teacher, the administration and her parents know where, on a continuum, is she today in the quest for learning and how much more does she have to do so she can plan her calendar and to-do list according.

Chapter 1

THE PROBLEM: HOW TO INCREASE STUDENT ACHIEVEMENT?

Internet: The Future of Business is Now

The Internet has completely taken the entire Information Technology (IT) world by storm. IT businesses are scrambling to keep up. Paranoia in Silicon Valley and Redmond has been the operative word in do-or-die revolutionary improvements in the IT industry. The companies that have adopted the new philosophy of Web-based commerce, and all that it entails, have grown as never before in the history of mankind. Those that have not, well . . . they are not here anymore.

The Internet is fundamentally changing the way consumers and businesses communicate, obtain and share information, purchase goods and services, and transact business, and is experiencing spectacular growth. (Bear Stearns, p. 1, 1999)

The global economy is following suit and Web-based ‘e-commerce’ is changing how we work and live.

A Commerce Department study to be released today concludes that the digital world is driving the nation’s economic growth, holding down its inflation rate and transforming the American workplace. (S. Page, p. 1, 1999)

These changes have created new expectations in how communications should happen. Higher expectations create new opportunities for growth of the Web-based lifestyle that is invading almost every facet of life in corporate America. With such massive growth comes ‘growing pains’, which are sure to increase with the growth. The have’s and the have-not’s will be bi-polarized as never before.

Businesses are increasingly using the Internet for mission critical applications such as sales, marketing, customer service, and project coordination. The Web is becoming an essential tool for business travelers. As business people grow accustomed to the high-speed access that they have at work through high-speed connections, they are seeking similar high-speed access at home or while traveling. (Henry & Waldorf, p. 17, 1999)

A revolution is in progress and the chaos is rippling the very fabric of society. Who knows what next improvement in technology will affect you and I, today, tomorrow and in the future? But one thing is for certain; our children will be more affected than us as we struggle to educate them for survival in this changing world.

Internet: The Future of Education is Now

Already the Web is impacting education in positive ways never dreamed of only a couple of years ago:

- Internet traffic leading to educational web sites has increased from March 1999 to May 1999 by 105%, leading all other web sites in percentage of traffic increases (J. Kornblum, 1999).
- School districts are adopting Internet-based communications to bring parents closer to the school community.

School districts are using technology to promote home-school communication. Schools now make it possible for parents to check their child's grades, verify absences and communicate with teachers . . . all from their personal computers. (K. J. Amundsen, 1999)

- University professors are embracing the Web-style of instructional delivery to the point of not even showing up for class.

This fall, [James] Norwood [University of Minnesota drama teacher] will abandon mass lectures for the tap of computer keys, promising "one-on-one" digital interaction with perhaps as many as 200 undergrads. He will ask questions, critique papers and post lectures over the Internet. (D. Brauer, 1999)

- Online degree programs are becoming so popular that financial aid funds have been earmarked for 118 institutions in 17 states under the Distance Education Demonstration Program, a pilot program approved last year after years of aid restrictions for non-traditional programs (Associated Press, 1999)
- Teachers have a seemingly infinite number of resources to choose from when designing lesson plans.

Five years ago Kent launched it's "Teacher's Toolbox", an online set of resources to help teachers in their classrooms and their careers. Today, the toolbox contains scores of topics, from staff development programs to online attendance and grading at secondary schools. Activity calendars, personnel forms, class rosters, lunch menus, student portfolios, district policies, and state learning objectives are available with a few keystrokes. Lesson plans developed by Kent teachers are tailored to the state learning goals, district textbook adoptions and local topics of interest. (D. Folkerts, p. 11, 1999)

- Even intelligent life elsewhere cannot escape the reach of the Internet as SETI is recruiting half a million students worldwide to download a screen-saver like program that will set up a data-

gathering experiment on their PC's to help crunch numbers downloaded from the Arecibo radio telescope in Puerto Rico and automatically return results to SETI@home. E.T., Phone home? (O. Port, 1999)

Caveats for the Classroom

With the chaos of changes in communication come other distractions that are not so positive as so many of the Web wonders available. Pornography, hate crimes, blueprints for weapons of Mutually Assured Destruction, ethnic cleansing, militant hacking, and other dangerous sites are there for all to see, free for the picking and uncensored. The issue of Internet filtering grows with usage of Internet in schools.

All U.S. schools from kindergarten to 12th grade can get free Internet filtering software as a plan to encourage participation in a two-year Yankelovich study of children's Internet use, Websense announced Tuesday at the National Educational Computing Conference. (USA Today, 1999)

In schools and homes throughout the nation, students are so distracted by the wealth of information on the Internet as well as from outside pressures (e.g., video games, computer simulations, sports, drugs, violence, sex, divorce, et al.) that this 'fire hose' of information overload keeps many of them from actively engaging in the learning process.

Teen-agers . . . have so many competing obligations that sometimes the most magnanimous impulses are the first things to toss aside. (R. M. Henig, 1999)

We hear the cry for educational reform over and over, countless measures are taken, research findings are reported, new strategies implemented and yet, schools are still being held accountable for most of the nation's ills. Mention the word 'Columbine' and you immediately understand, shuddering in the realization that yes, Virginia, it can happen in your backyard. So who is to blame?

One group to blame is the parents. But, the reality is that many times help for children at risk is seemingly not there, with both parents working, or single parents making do, or no parents at all there to assist in the learning processes for academic and life skills.

Researchers say children are raising themselves; they are alone after school when the risky behaviors surface. (K. Dwyer, 1999)

Or should we blame the kids? Where the finger pointing goes, so goes changes in legislation to keep the votes coming in.

Gov. Mike Foster [of Louisiana] on Tuesday signed the nation's first state law requiring pupils to address teachers as "ma'am" or "sir" or use the appropriate title of Mr., Miss, Ms. or Mrs. The Republican governor and other politicians said the law will help restore respect in the classroom. (Chicago Tribune, 1999)

Or, blame the schools? The new voucher plans in the state legislatures are defining a chaotic change that will surely ripple the fabric in public education nationwide for decades to come. And the fabric of society ripples on . . .

Florida Gov. Jeb Bush signed legislation Monday making the state the first in the nation to offer a statewide program of vouchers to help parents of students in failing schools offset the cost of private education. (Reuters, 1999)

Or, forget the whole thing and pull the kids out of school all together? Forget all of the educational research, academic standards, socialization of students, and let each family do it their own way – a rugged individualist approach to preparing children for their future.

The U.S. Department of Education estimates that more than a million students in the United States are taught at home. There are likely to be a million different ways these students are taught, experts suggest, depending on the reasons their parents decided to homeschool. (Association for Supervision and Curriculum Development, 1999)

Follow the Leader (i.e., Don't Blame and Don't Boss)

Blaming others for our ills and a failing educational system is one way to deal with the issue of change. But the purpose of this white paper is to deliver an answer to The Burning Question: How do we increase student achievement in a New World of chaotic change? Why, follow the best practices of the leaders in business and industry, of course!

About six years ago, I remember watching a televised educational conference featuring Dr. W. Edwards Deming, broadcasted live from his hospital bed (he died shortly after). At one point during the conference Deming, an evangelist for doing away with the 'Normal Curve' grading system we all know and grew up with, was asked how would we know how students were doing if we didn't 'grade' them with report cards, tests, quizzes, etc? In his inimitable 'Grumpy Old Man' style, he glared out at the camera with a scowl on his face and blurted out two words I will never forget: "ASK THEM!"

It seemed a simplistic answer at first . . . but Deming, the prime mover of the post-WWII Japanese industrial miracle, based his philosophy on human nature as well as Statistical Process Control (SPC) and wrote a book, Out of the Crisis, telling everyone how to do it (Deming, 1986). People know how

well they are doing because they are the ones who ‘do the doing’. And, if they have the proper data, they will improve the processes that will lead to an increase in product and service quality. One SPC evangelist posted this review on the Amazon.com review section of Deming’s book:

Statistical Process Control is for management and educators. Anyone that has to judge others by how well they perform on the job or in the classroom must read this book. Statistical Process Control and the Deming philosophy should be applied in first grade elementary schools and should be taught after fifth grade. Could improve the processes of education if tackled as a system. Could supply a quality product (your child) with evidence of statistical control charts at minimum cost within minimum time. Makes the 70, 80, 90 grading system obsolete. Exposes the inefficiencies of Western Type Management. Boosts your moral if oppressed by inefficient management. (cfranz@accucomm.net, 1999)

Trusting students to do the right thing may seem to be a ‘radical’ notion and many will feel that kids do not know what is best for them. I argue that students will learn what we want them to learn and, at the same time, what they want to learn, because the knowledge and understanding they need to succeed in life is common for both ‘them’ and ‘us’. Everyone wants to succeed. If we allow students to experience small steps of success on a daily, hourly, and now *Speed-of-Thought* rate they will follow through and do it willingly. The following is an explanation of what needs to be done so the students in our schools have the opportunity to receive such an educational experience. Let’s give our children a piece of the action, the proper toolset to get the job done, and step out of their way.

SOAR and Just-in-Time/Speed-of-Thought Educational Processes

With the confluence of high-speed information access, screaming CPU speeds to crunch the available data and massive storage capabilities to keep the desirable, digital results at hand comes a never-before-seen approach to education. This approach can be defined as *Student Ownership of All Resources* (SOAR) learning. SOAR learning is where students access necessary academic and co-curricular content in the moment, not having to wait for the teacher’s delivery to the class, nor for other students to ‘catch up’ to their peer group.

A student engaged in SOAR learning will use a digital toolset to access her own, personalized set of curriculum standards described in her *Digital Individualized Education Plan* (DIEP). The DIEP is based on milestones, described in step-by-step objectives, derived from her vision (i.e., where she wants to go today, tomorrow and throughout her educational career) in conjunction with the consensus of her parents, her teachers and the school administration, and following the appropriate legislative and accreditation standards for graduation requirements.

The immediacy of the curricular content access is a *Just-in-Time* (JIT) approach to instructional delivery, where the student will have instantaneous access to the ‘material’ of education defined in the SMC. The combination of *Just-in-Time* instructional delivery with *Speed-of-Thought* (SOT) need-to-know inquiry methods will be the fundamental driving force in increasing the amount of *flow* (Csikszentmihalyi, 1991) she will experience in the classroom. Increases in flow will reinforce her active engagement in the lessons being learned, and lessen any distractions from the SMC milestones pending in that moment.

You have heard about how a musician loses herself in her music, how a painter becomes one with the process of painting. In work, sport, conversation or hobby, you have experienced, yourself, the suspension of time, the freedom of complete absorption in activity. This is "flow," an experience that is at once demanding and rewarding--an experience that M. Csikszentmihalyi demonstrates is one of the most enjoyable and valuable experiences a person can have. (religion-and-spirituality@amazon.com, 1999)

MS OFFICE/Internet Explorer as SOAR Toolset

The SOAR approach for Knowledge Worker-type students will need an adaptation of an available toolset that exists in leading business and industry today: MS OFFICE combined with Internet Explorer. The latest version of this powerful and commonly available (over 100 million licensed Office users worldwide) toolset has experts predicting more improvements in how Knowledge Workers will do business.

With Office 2000, we are at the dawning of what I would characterize as the third generation of tools for knowledge workers . . . Office 2000 unleashes the power of the Web work style, the most efficient way to work with business information and collaborate with other workers. (Ballmer, p. 8, 1999)

These current Knowledge Worker tools, which offer the seamless confluence of information access and organization, will need to be adapted to deliver SOAR educational processes. Then, children will be engaged to create projects and solve problems on-the-fly, and therefore, will achieve personal goals as well as meeting global standards that are expected and needed to survive today. Not by keeping them ‘on task’ as the Old World Boss-type teachers would try to control them through manipulation and reward systems, but by keeping them ‘flowing’ as New World Educational Consultant-type teachers will help to facilitate the process as the students learn on-the-fly – exactly what they want and exactly when they want it.

For the SOAR educational processes to exist, Gates' (1999) twelve key steps to creating a Digital Nervous System have been used here as a structural framework for describing a variation on the theme, called the Digital Nervous School System.

THE SOLUTION: SOAR

A Twelve-Step Program to Educational Reform

In Gates' (1999) blueprint for preparing businesses for the future, he outlines twelve key steps in building the Digital Nervous System (DNS) for business solutions. The following are adapted versions of Gates' original twelve steps for building a DNS designed for school systems:

1. Insist that communication flow through the school community over e-mail so that shareholders (i.e., students, parents, teachers, and administration) can act on news with reflex-like speed.
2. Study student achievement and interest data online to find patterns and share insights easily. Understand overall student trends and personalize instruction for individual students.
3. Use PC's for student performance analysis, and shift teachers into high-level thinking work about coherent curriculum, and improved lessons designed to increase student achievement.
4. Use digital tools to create cross-departmental/cross-grade level virtual teams that can share knowledge and build on each other's ideas in real time, worldwide. Use digital systems to capture student academic achievement for use by the shareholders, when authorized.
5. Convert every paper process to a digital process, eliminating administrative bottlenecks and freeing shareholders for more important tasks.
6. Use digital tools to eliminate single-task jobs or change them into value-added jobs that use the skill of a knowledge worker.
7. Create a digital feedback loop to improve the efficiency of physical processes and improve the quality of educational delivery and student achievement assessment. Every authorized shareholder should be able to easily track all of the key achievement indicators.

8. Use digital systems to route complaints immediately to the shareholders who can improve the educational delivery.
9. Use digital communication to redefine the vision and the boundaries around the school community. Become larger and more substantial or smaller and more intimate as the student population situation warrants.
10. Trade information for time. Decrease systemic lags in knowledge-of-results time by using digital transactions with all shareholders, and transform every lesson into Just-in-Time delivery.
11. Use digital delivery of knowledge-of-results to eliminate the teacher from the student self-assessment of achievement. Teachers use digital tools to add value to student achievement.
12. Use digital tools to help students solve problems for themselves, and reserve more personal contact to respond to complex, high-value student needs.

A few lighthouse school districts are tapping in to the current level of technology, much like the business world and the results are predictably positive. At New York State's Hilton Central School District, a Digital Nervous System has been implemented and communication has increased dramatically. Steve Ayers, Director of Business Operations for the Hilton Central School District recently commented on how things are going with their DNS in place.

"If there was one single payoff we were looking for, particularly in our first year of implementation, communication was it," Ayers says. "We feel that, with judicious use of these sorts of communications tools, the frequency of meetings and the quality of meetings that we hold among staff members will improve significantly." (Microsoft, 1999)

Ayers goes on to comment on how MS OFFICE tools are being used all over the district, due to the newly installed DNS.

"Teachers and students are using the Microsoft Word, Microsoft PowerPoint® [presentation graphics program] and Microsoft Excel [spreadsheet] tools everywhere," Ayers says. "Lessons that were two-dimensional and chalk-and-blackboard in the past are now delivered with all the power and effect that color and motion and graphics have. Isolating the benefits that are tied to technology versus other school improvement initiatives will be a challenge, but I certainly expect it will lead to an improvement on test score data." (Microsoft, 1999)

DNSS: One Step Further with Standards

A Digital Nervous System is a great starting point for schools to increase communications and empower shareholders to continually improve the educational processes. A Digital Nervous *School* System (DNSS) is a customized variation on a theme.

The major difference between a DNS and a DNSS is in the integration of *standards*. A Digital Nervous *School* System (DNSS) takes the concept one step further with the integration of sets of academic and co-curricular *standards* to insure that all students receive the required information necessary, through the metaphor of a *Student Digital Dashboard*, for fulfillment of graduation requirements.

Student Digital Dashboard

Schools are a unique, service-oriented 'business' where the 'product' of student achievement is measured traditionally by homework grades, report cards, tests, quizzes, standardized achievement and aptitude tests--all of which have lag time inherently built in to the processes.

Students who are engaged in a SOAR program, built on the DNSS infrastructure, will have the opportunity of knowing, JIT, what educational standard they are working towards in each academic and co-curricular content area, how far have they come in achieving that standard, and how much more they have to do to complete the standard in question. Picture a *Student Digital Dashboard* (SDD), where students are in touch with what standards they have to master, when those standards are to be mastered, and how far they have come in mastering said standards.

The SDD will allow for detailed analysis of exactly where the student is in regard to the milestones pending. This accuracy and availability of pertinent information stems from the DNSS responding, through the SDD, to shareholder needs at the *Speed-of-Thought*.

A Day in the Life of SOAR Students

Looking at the SDD we can see that this student, let's call her Maja, has her daily schedule pretty much set as she logs on at home, before leaving for school. Maja can see that her homeroom/Math teacher, Mr. Smith, has posted suggested Internet resources for her lesson for the day on her schedule, as have Ms. Cortez and Ms. Gardon for Science and English. She is going to have lunch with Susie and Min Yu in the courtyard and will order her lunch in homeroom (automatically debiting her parent's school account at the business office) to be prepared fresh in the cafeteria before hand so she can pick it up

JIT. Maja has joined the *skunkworks* team who are collaborating with students in Anaco, Venezuela at an international school there to study the Venezuela Rainforest and she has a 2:30 real-time video conference to report back to Anaco her findings as well as download their's. She also is going to band after school and will print up the new piece of sheet music her band teacher has left for her on the schedule.

Maja has an inbox of several categories listing her daily messages and contact resources, in house and throughout the world. Since she did her 'homework' last night she has cleared her inbox of all messages and starts fresh this morning, except . . .

On Maja's SDD she has a to-do list of her own set of standards that are in various stages of mastery. One of the standards, Language Standard 7.3.22, has not been completed by the milestone she has set-up. An automatic reminder popped up to tell Maja that she is 'behind' in her completion date. An e-mail was automatically sent to her parents notifying them about the situation. Her Language teacher has posted a bright red "!" message in her to-do list, also reminding her about this situation. We can't tell from this situation why Maja is behind, but we can be assured that all shareholders know about it, and have known about it since the very first moment, at the *Speed-of-Thought*, when Maja missed that desired milestone. This 'early warning' system helps her, her teachers, the administration and her parents know that something is amiss. Maja might want to reschedule her classes today to finish Language Standard 7.3.22 because when she gets home her parents will want to talk to her, if they haven't already emailed her already. And the building principal, who logged on at 5:30 am from his cellular connection in the car, on the way to work, saw Maja's SDD results (automatically emailed to him as well as the teacher when the milestone was passed by unmastered) has already fired off an email to the Language teacher, asking him if he needs help with Maja's milestone completion issue.

At the bottom right hand corner of Maja's SDD we can see the 9th grade 1999/2000 school standards. This link takes all shareholders immediately to the entire educational program that Maja is working on right now. This program has been developed, edited and published in Maja's *Digital Individualized Education Plan*.

Digital Individualized Education Plan

As the SDD/DNSS is used throughout the school, by all the shareholders, improvements will happen because all shareholders will know exactly how students are achieving.

The question of what set of standards are to be used is answered in the *Digital Individualized Education Plan* (DIEP) process. In SOAR learning, with the teacher/student relationship changing by a more efficient method of instructional delivery, value-added time will be available to custom-tailor a DIEP for each student, no matter what ability level or talents/differences they exhibit. Paper IEP's have been, traditionally, reserved for only 'Special Needs' students, creating mountains of bureaucracy and consumes huge amounts of time and money in the selection process. I don't know about you . . . but my kids are special, if not only to me.

The DIEP is a digital reverse engineering process of the results of what the child will receive along the educational path towards graduation. This process defines in detail the desired goals and objectives that meet all mandated standards by means of a contractual agreement directly tied to a scope and sequence of curriculum content areas supporting those desired outcomes. The process takes into account differences in future interests after secondary school: technical or community college, Ivy League or state universities, direct-to-work programs, travel, etc.

For example, Maja, along with her parents, regularly meet with the teachers and guidance counselors--in person the first time and increasingly online thereafter--to go over interest survey data sets that she has completed online, before the DIEP meetings. This data set from the digital survey questionnaire instrument indicates what her interests currently are and points to the set of standards and milestones necessary to achieve the goals derived from the interests.

Maja's DIEP, that she is successfully following right now (except for the Language issue), has been tailored to meet her goal after graduation, with the blessing of her parents, of studying music at the Julliard School in New York City. Maja's interests were noted and she met face-to-face with her parents and teachers and guidance counselors to talk about, plan, and publish a set of standards that is designed to exceed all of the entrance requirements for matriculation at Julliard. There are no guarantees that she will be accepted, because she has to pass a live audition as well as meet the other standards, but she has a good handle on what it takes to enter the school.

Susie and Min Yu, Maja's friends, on the other hand, have other goals that have been addressed in their DIEP's. Susie wants to become a registered nurse and her DIEP reflects a more technical, direct-to-work group of curriculum content standards that exceed the minimum requirements for entrance into a local community college close to her parents, for she does not want to leave town or get a liberal arts degree. Her personalized program is as challenging than Maja's, but in other areas of interest. She

does not attend the skunkworks or band classes as she leaves school early and works as a ‘candy striper’ to learn more about nursing through volunteering at the local hospital. Since she leaves school early she works at home on her elective nursing survey courses, through her Internet connection to the DNSS. After graduation she will enter the community college as a sophomore from all of the extra course she completes in her DIEP in high school.

Min Yu’s program is designed to exceed the entrance requirements for pre-medicine at a state university and her standards reflect inclusion of advanced Maths and Sciences (using Advanced Placement course outlines) as well as SAT preparation courses she will have to master to pass the muster. Her skunkworks group is involved in an ‘Odyssey of the Mind’ project that, they hope, will win at the regional level and take them to the national competition later in the spring. This program looks great on her transcript to round out her academic experiences with a more creative, ‘outside the box’ approach to problem solving. She knows that the state university admissions officers look for well-rounded candidates for pre-med, not just brainy Math and Science types.

As Maja, Susie and Min Yu develop physically, emotionally, socially and intellectually, their interests will probably evolve and the set of standards they have previously been using might no longer be appropriate for desired outcomes. With this in mind the standards database automatically integrates the already-mastered standards with the newly desired direction and updates the DIEP’s at *Speed-of-Thought*.

Less Lag Time, More Learning Time

Today most students have to wait until the teacher ‘grades’ the quizzes and tests, or returns homework maybe on the next day, maybe much later or never at all. And yet, since the ’60’s (Hunter, 1967) educational research has reported that knowledge of results is a leading indicator of increasing student achievement. As students achieve, the opportunities increase because they know more than before. Therefore, the content should ‘evolve’ around them at *Speed-of-Thought* so the curriculum can ‘keep up’ with the student, not like now, in most schools, where the students, in traditional classrooms, have to ‘keep up’ with the curriculum.

Curriculum should be a living, breathing resource in education--a dynamic ‘My Backpack of Resources’ that supports student interest as well as integrates standards in a logical, organized manner. Textbook publishers will probably disagree as paper-based books will become obsolete, but the ‘Hippocratic’ oath for teachers goes something like “What is best for the children?”

Skunkworks: Student-Centered/Teacher-Supported Collaborative/Cooperative Learning

What is going to happen in a SOAR learning environment will be the immediate transformation of the teacher as focal point in the educational process to the student as focal point. The student will be empowered to take responsibility for their own work and skill sets and they will turn to the teacher for advice and encouragement. Students will turn to each other in teams as they cooperate/collaborate, in real time, in the classroom, in the field, at home or from another school altogether anywhere in the world. Teachers will guide them to develop *skunkworks* that are independent of the traditional classroom activities, go off on their own educational journeys, set goals, complete milestones and solve problems everyday . . . and the results will be earth-shattering for ‘them’, and for ‘us’, as well.

Students will not be bored, ‘off task’ or thinking about everything else but school in a SOAR learning environment. They will have more rights along with more responsibilities as Knowledge Workers. This new reality for the student, combined with a coherent, adaptive curriculum, and a digital, dynamic knowledge of results through *Speed-of-Thought* assessment tools, will be a major driving force in changing the nation’s ills as well as improving the opportunities for continuous improvements for all.

Teachers will be considered Educational Consultants in SOAR learning--experts who ‘arrive’ JIT to guide the student to continued success. Consider the teacher a kind of ‘personal trainer’ for knowledge work, much like the types who pace the floor at your local health club. You get on a weird-looking machine, glance down at the myriad maze of buttons and instructions for the first time and wonder how the new fangled contraption works. Either you, a). just push the buttons to see what happens, b). lean over and ask the person sweating profusely next to you how this thing works, c). leave the device to the technically inclined, or d). call over a personal trainer to guide you through the initialization process. The trainer is usually the last one to get involved in the process because she is in much better shape than you are and, as we all know, it’s embarrassing to ask for help. Oh, heck I can figure this thing out by myself. Kind of like Christmas morning when the last step you take is to read the instruction manual, after trying over and over to put it together.

Students experience this embarrassing situation everyday in the classroom, but the problem is the teacher is so busy ‘teaching’ that the students do not have enough one-on-one contact time to ‘get it’ the first time. Children end up waiting, distracting others, and the teacher gets frustrated, then mad and then gets even. ‘Go to the principal’s office!’ is the final cry for help as teacher makes it through

another day, burned out and ready to throw in the towel and get a ‘real’ job. Those that can’t . . . teach, right? In a SOAR school, students work by themselves or in skunkworks until they need help, period.

SOAR teachers, with more time to actually think and read, will form their own skunkworks in cadres of colleagues, to come up with better solutions to the DNSS, DIEP’s and, more importantly, more value-added time for kids. Guiding them to successes when they need a boost. Listening to them when they have personal problems. Giving them direction when asked. Instructing them when the students ‘just don’t get it’. After all, it’s easy—once you ‘get it’.

Teachers as Educational Consultants will have the data at their fingertips in *Speed-of-Thought* to make field research accessible and a reality in SOAR schools. An ‘EC-centric’ school will publish findings and add value to the body of research on a continuous basis. As students are off on their ‘own’, working individually and in their collective skunkworks teams, teachers will be also modeling these behaviors at the same time—modeling appropriate behaviors are another strong indicator for increasing student achievement (Hunter, 1967).

The old adage that teachers will become obsolete with the advent of the computers still holds no water in SOAR schools today. If anything, teachers will be more effective consulting as students work in DIEP’s where everyone is on a different page at all times.

Teachers will gain immediate respect from students as the relationship changes from Boss/Task Worker to Educational Consultant/Knowledge Worker and true collaboration exists as they ‘SOAR’ together. No need for creating new laws to force respect on already-disillusioned children by making them address adults as ‘ma’am’ or ‘sir’. You can’t make anyone ‘do’ anything. So what will the new law create—more criminals? Will the students who do not acquiesce to the state mandates get fined, go to the principal’s office, get thrown out of school, or go directly to jail? The absurdity of such legislation only reflects how little is known about human nature by the powers that be.

Teachers will be *the* major influence in the third millennium for our children. Just as they were in the one-room schoolhouses once scattered all over the nation that raised a generation of literate, respectful children a few short years ago. Many of today’s children, whose parents are too busy or not there, who are attending schools that are ‘failing’ in the public eye, who are being coerced by politicians who want to blame everyone else so they are guilt-free and can keep the votes rolling in, need SOAR schools so they can have true, value-added contact from teachers as both work together, learning side-by-side.

Parents as Partners

SOAR schools will reach out to parents and bring them in, virtually and physically, to the school community on a *Speed-of-Thought* using the SDD/DNSS interface to communicate good and bad news. Traditionally, bad news travels faster than good. A phone call from school usually means that Johnny is in trouble, again. The report card shows up four or five times a year and then he gets a good lickin' for failing math, again. The building principal gets a phone call from home and a meeting is scheduled a week later. And so it goes... No wonder schools are 'failing' everywhere.

SOAR schools automatically notify all shareholders, JIT at the *Speed-of-Thought*, through e-mail, voice mail and NetMeetings, that Johnny is or is not meeting milestones. Everyone involved knows all the time exactly where Johnny is along the path to graduation, even if he is in first grade! And if the news is bad there is plenty of time to implement corrective measures on a face-to-face, ear-to-ear, or keyboard-to-keyboard basis with all shareholders as the need arises.

With this immediacy of knowledge of results comes plenty of time to develop effective strategies for increasing achievement for every child, no matter where they are on the continuum of their DIEP.

Parents will feel and be part of the educational process in SOAR schools. They will have a direct impact on the lives of their children, not only in the home but in the school as well. Parents will know all the time what is happening at school. Homework will be fun and self-rewarding, not the drudgery most parents and children have to go through to 'finish the worksheets before dinner'. No more, "what did you learn in school today?" and the obligatory reply, "Oh . . . nothing." There will be no doubt what goes on in the classroom as SOAR learning is transparent, immediate, and clear to all shareholders all of the time.

Administrators as Senior Program Managers

With the changes in teacher/student relationships in SOAR comes a new definition of the role of the administrator. Today administrators have 'failed' in schools as well as the teachers and students. They are overworked, isolated, burned out and constantly worry about job security—especially if the test scores are not high enough! They deal with so many issues from cops in the halls to union grievances from cafeteria workers that they have little or no time for their main reason for being: helping teachers do what is necessary to increase student achievement.

SOAR schools offer a different set of rights and responsibilities for administration in education. The administrator becomes the instructional leader in the Digital Nervous School System--the 'CIO' in charge of keeping teachers informed of breakthroughs in technology, checking systemic functions using student achievement as the ultimate benchmark as well as insuring that the DNSS stays up and running.

The mission and vision of the SOAR school, with all the systemic functions involved, is 'tended to' and reported by the administrator to the shareholders at the *Speed-of-Thought*. No more waiting for test results to come back from the scoring services, no more collecting report cards four times a year and checking for D's and F's, no more once or twice a year 'formal teacher observations' of teachers performing 'dog-and-pony shows' that waste both teachers' and administrators' precious time. Results matter and only results.

With the student achievement information available at *Speed-of-Thought* shareholders know that the focus of student-centered learning is or is not in tune with their expectations. An administrator can log onto every teacher's classroom folder of student achievement data to see how the students are doing on a daily basis, and, in the moment, 'observe' every student in the school and their collective and individual progress everyday along with classroom results from every teacher. When results are not up to par the administrator is there to help the teacher, student and parents as to possible corrective measures.

Another benefit of a SOAR school system is in the data management that haunts administrators constantly with a mobile national population, picking up and moving from state to state at a moment's notice sometimes. Report cards don't show up before school starts, children are placed in wrong levels or not identified as having 'special needs'. Time marches on and the students who slip through the cracks sometimes never 're-appear', failing or dropping out to do other, 'more important' things.

Students who transfer in from other SOAR schools will bring with them a complete digital transcript with them, posted on the Web and viewed by any authorized shareholder at the *Speed-of-Thought*. Everyone will know where each and every child is in their educational career, what their career plans are through the DIEP, and all the parent contacts will be automatically updated as soon as they log on the new SOAR school website. And guidance counselors as well as college admissions officers will welcome with open arms the free data exchange, not having to wonder about validity of test scores and missing required courses necessary for entrance admissions procedures.

Library/Media Specialists as IT Manager

It is extremely important in a SOAR environment that the IT infrastructure of the DNSS is seamless, transparent, online 7 days a week for 24 hrs. every day (7X24), and accessible by all shareholders on a *Speed-of-Thought* basis. The whole point of a SOAR-related DNSS is to allow access to All Resources, period. Therefore, the Librarian/Media Specialist staff need to manage the IT portion of the DNSS so that no one is cognitively aware of its existence, except that the DNSS works every time, all the time, and that **all resources** are there for the asking. Some traditional-style librarians like hoarding and divvying out information, books, magazines, etc. as if *they* own these resources. The new SOAR IT manager will realize and support Student Ownership of All Resources, SOAR, right? With the right training and full acceptance of the mission and vision of SOAR schools this important issue will be resolved. If not, the SOAR concept cannot work.

Technical Challenges to SOAR (Student Ownership of All Resources)

It won't be easy to develop, but then, the good things never are. A few areas for concern are:

- The development of such a project is labor-intensive, therefore costly.
- The concept has never been modeled before, so it is truly an 'inventing the wheel' venture.
- The risks involved are great, for we are talking about children—our greatest natural resource.
- Many critics will point fingers and blame, as they do at every 'new thing' in educational reform.
- The issue of saving schools is riddled with political footballs, with special interest groups coming from all sides, because schools are 'failing' society.
- There will follow a natural lag time in positive results in increases in student achievement.

Conclusion: Build It and They Will Learn

Project SOAR (i.e., A Digital Nervous School System, using Student Digital Dashboards, following the academic and co-curricular standards chosen from the range of integrated databases available and explicitly defined in Digital Individualized Education Plans) will prove to offer children the power, the

flexibility, the resources and the reason to always achieve at their maximum capacity, at their own rate, using their own interests to keep it fun and creative.

One final thought: Adapting Gates' concept of two dimensional customer data (p. 206, 1999):

1. 1. by aggregating data from student achievement statistics that track trends and patterns on which to base analysis, planning, and decisions, and
2. 2. collecting detailed information on the individual student,

Project SOAR will provide personalized service—the future of educational delivery . . .

. . . @ THE SPEED OF THOUGHT.

GLOSSARY^{1[1]}

Digital Individualized Education Plan. A digitally written contract of agreed-upon milestones, broken down into explicit objectives, based on student and parental needs and desires as well as local, state, national and regional accreditation agency standards and practices. Reverse engineered to structure, organize and be linked to an individualized scope and sequence of integrated digital lessons that, if followed, will result in the achievement of educational career goals.

Digital Nervous School System. Digital processes that enable a school community to perceive and react to its environment, to sense student needs and interests, and to organize timely responses.

Educational Consultant. Teachers whose fundamental task is to facilitate the student access to Speed-of-Thought curriculum, based on agreed-upon standards and benchmarks as defined in the *Digital Individualized Education Plan*.

Flow. A state of being when students are fully absorbed in activity during which they lose their sense of time and have feelings of great satisfaction.

Just-in-Time. A system of curriculum control based on the Japanese *kanban* system in which information is delivered just in time for learning. The better the information system between a student and curriculum, the less wait time the student has to experience, with motivational increases and less discipline issues.

Knowledge Worker. Students whose fundamental task is analyzing and manipulating information. PC systems can turn students into knowledge workers by giving them better information about the lessons they are learning.

Skunkworks. A team of students that goes 'off task' to learn new concepts, outside of the traditional instructional delivery techniques (lecture, testing, etc.), following their *Digital Individualized Education Plan* and learning how to work together on project/problem-based learning.

Speed-of-Thought. A new benchmark for information access, where data is accessible to a student so she can get what she needs when she needs it.

Student Digital Dashboard. A real time digital display of past, current and future academic and co-curricular student achievement.

^{1[1]} Adapted from BUSINESS @ THE SPEED OF THOUGHT (Gates, 1999)

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