Students and parents need and or/want access to information about what happens in class and what progress is being made and how they can get help along the way. Teachers want to provide this information, but with everything else that they do in their day, how can they be expected to learn how to create effective ways to disseminate this information and then to organize and effectively present it. An easy to use, powerfully adaptable system needs to be created that will provide for this solution. Along the lines of corporate intranet or portal system, schools and teachers need a similar tool that will allow them to easily create and post information accessible by others in the learning community.

While many pieces of this puzzle exist in some form or another, nothing is currently available that combines all the needed tools into a unified, simple and useful tool. This project proposes to discover what teachers feel is important information they would like to have more accessible for themselves, their students and their parents and additional what students and parents feel they want and need. Based upon these conclusions, I will design and prototype an easy to use teacher/student/parents communication system for Keys School. Along with this system, I will create a prototype of a new notebook device for teachers to use.

Michael Thompson
LDT Master’s Project
February 20, 2001
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THE LEARNING PROBLEM

It has been shown that strong connections between parents and school improve student learning. (Bibliography, item II) If we could figure out what information teachers could provide that would enable and encourage parents to help their students learn and subsequently, if parents could provide teachers with a better understanding of students, teachers could better teach to the students’ needs. Therefore, by knowing what information to present and designing a system that allows for the easy transmission of this information, the parent and teacher connection can be made, ultimately leading to greater student success.

Teachers at Keys School are under extreme pressure to provide students and parents with grades, homework, classroom and other pertinent information. Teachers have at their disposal a variety of tools to make this information available, yet the time it takes to learn how to effectively utilize these tools is taking a toll on the teachers. If there were a way for teachers to easily create classroom materials that could be effortless published so that students and parents would have access to them, teachers lives would be easier and the greater Keys community would be happier. In the same manner, if teachers could just as easily have access to student and parent information and be able to make meaningful use of it, teachers would also be more productive. Therefore, a strong need exists to create a system that will allow for all of this interaction and information exchange to take place, without requiring additional learning and time on the part of the teacher.

BACKGROUND

Research has proven that strong connections between parents, students and teachers have significant impact on supporting and improving learning. However, the responsibility for creating these connections typically falls upon teachers and requires them to spend significant amount of time and energy fulfilling this task. Given the rise of the Internet in homes and offices, parents and students are beginning to assume that this medium would be a good method for making these connections. While it is convenient for them to get information this way, it is often quite difficult and time consuming for teachers to make it possible. Not only do they have to spend the time learning how to create websites, they subsequently must spend the time redoing all their information in HTML and then constantly updating the info.

After spending the past few years researching the market for products that will effectively address Keys School teacher, student and parents’ needs, it has become clear that an optimal product does not yet exist. While there are many Student Information Systems that will allow the school and teachers access to student data and will even allow some of this information, such as grades and attendance to be seen by parents, no system combines the ease of use and full compliment of tools necessary to meet the needs of Keys or most other schools.

Additionally, in support of the need for a new input device, all Keys faculty have school purchased laptop computers. While these have been valuable, they are in essence, underutilized. Therefore, a new, more needs based notebook device needs to be created for future, optimal effectiveness.
WHAT I PLAN TO DESIGN

In order to effectively meet the needs of teachers, students and parents at Keys School it is clear that a new communication and information management system needs to be created. In creating such a system, many issues need to be considered. These issues include, in no particular order, the needs of the teachers for information about students, the desires of the students and parents for information from the school and the teacher, the needs of the teachers for an easy to use, yet powerful tool, and the desire by the teachers to have a product that can be used both at school and elsewhere.

Therefore, in order to meet these needs, I plan on designing two essential components. First, and most importantly, I intend to create a web-based teacher information and creation tool that will allow teachers not only to access and create student information, but also to create classroom materials and other documents effortlessly. This tool will allow teachers to publish material both in a traditional print format, and additionally in projected and web-based formats. By seamlessly integrating both the tools of creating and accessing information, teachers will not have to spend precious time learning a whole new set of programs and conventions, but will be able to be more effective and productive.

Along with the essential classroom and teacher elements, this software will act as portal for the school and will allow the exchange of information between various aspects of administration and teachers. In a similar manner, the portal will be available as a communication device for students and parents as a means of accessing pertinent school information and communicating and submitting information to the school.

Along with this software piece, I see a need for a different sort of device for teachers to utilize to create and access these materials. While traditional computers would work fine for this task, they are almost too powerful and potentially confusing. Therefore, while more of a long-term focus than the software piece, I intend to design a new notebook device that will be tailored to the needs of the teacher.
DESIGN PROCESS

For the process of this project, I will employ a Cooper inspired goal directed design method. Through a careful surveying of the needs of teachers, students and parents at Keys School, I will create an intended use scenario for both the information and communication software and notebook appliance. Throughout this process, I will be focusing in on some of the key issues and areas of agreement between these diverse groups. My goal will be to find the best meshing of needs and desires so as not to create something that attempts to appeal to everyone, and actually appeals to no one. From these scenarios, I will first create the design document for the software and then create a mock up of the interaction. I will then employ a participatory design process and user test the design with teachers, students and parents at Keys School. At this point I will redesign the interaction as much as possible based upon the concerns raised in the testing.

Once this has been completed, I will make any needed adjustments to the software. After this, I will take the scenarios and create a design document for the notebook device. From this document, I will create a rough prototype of the notebook device and then test the device with member of the Keys School faculty. At this point, I will make any needed adjustments to the notebook and finalize the designs of each component.

DELIVERABLES

For this project, I will create a design document and a simulation of a software package that will be utilized by teachers to organize information and communicate with students and parents. This software will allow teachers to create all their classroom related information and effortlessly publish it in a variety of formats, such as print and the web. It will also act as a portal for the school and allow teachers and other members of the school staff to access student and school information. Lastly, it will be a public portal for parents and students to access, homework, attendance and other classroom and school information. I will also create a design document and prototype of a new notebook interface device for teachers.
TIMELINE

February
18 – 23 Finalize Proposal, Review Literature
24 Design Review
25 – 28 Begin surveying teachers

March
1 – 3 Finish Lit. Review
4 – 10 Survey parents, finish surveying teachers
11 – 17 Finish surveying parents
18 – 24 Begin software design
25 – 31 Finish software design

April
1 – 7 Test software
8 – 14 Begin designing prototype unit
15 – 21 Continue designing prototype
22 – 28 Finish prototype
29 – 30 Test prototype

May
1 – 5 Test prototype
6 – 13 Redesign
14- 17 Finalize display
18 Presentation
## BUDGET

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## CONSULTANTS

- Decker Walker
- Shelley Goldman
- Keys School Faculty and Parents
- Jim Vanides
- LDT students
M I C H A E L  G .  T H O M P S O N

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EDUCATION

STANFORD UNIVERSITY, Stanford, California, degree in June 2001
Master of Arts in Education, Learning, Design and Technology.

CARLETON COLLEGE, Northfield, Minnesota, 1992-96
Bachelor of Arts Degree in political philosophy.  William Carleton Scholar

TECHNOLOGY EXPERIENCE

INSTRUCTIONAL DESIGN INTERN, LEAPFROG SCHOOLHOUSE, Emeryville, California, 2001
Designed and produced interactive media and assessments for the LeapTrack™ system.

DIRECTOR OF TECHNOLOGY, KEYS SCHOOL, Palo Alto, California, August 1997 - present
Set-up and maintain campus-wide, networked, cross-platform computer system.
Oversee all aspects of technology integration, maintenance and application

PROJECT CONSULTANT, DIGITAL ORIGIN, Mountain View, California, Summer 1999
Designed and produced tutorial for digital video editing software.

TEACHING EXPERIENCE

COMPUTER TEACHER, KEYS SCHOOL, Palo Alto, California, August 1997 - present
Design and implement interdisciplinary technology curricula for grade Kindergarten through eighth.
Teach computer applications and history to grades Kindergarten through eighth and faculty.

TEACHER, UPWARD BOUND, Stanford, California, Summer 1999
Created and taught an interactive course on American History and political participation.
Provided mentoring and tutorial assistance to a diverse group of college-bound at-risk students.

TEACHING ASSISTANT, 49ERS ACADEMY, East Palo Alto, California, September 1996 - July 1997
Taught and mentored developmentally and economically challenged adolescent males.
Prepared and implemented curricula and individualized tutoring and mentoring programs.

RELATED WORK EXPERIENCE

RESEARCH ASSISTANT, MARTIN LUTHER KING, JR., PAPERS PROJECT, Stanford University, Summer 1996
Wrote and edited articles by and about King, non-violence, and social justice.

EDITORIAL ASSISTANT, OFFICE OF PUBLICATIONS, Carleton College, June 1994 - June 1996
Wrote, edited, and produced various publications ranging from policy statements to annual reports.

SKILLS

Proficiency in wide-range of applications including word processing, video editing and web design.
Skilled in network design and repair of both TCP/IP and AppleTalk networks. Trained systems
administrator of multi-platform LAN and web/e-mail server.
Best Classroom Practices. What Award-Winning Elementary Teachers Do.

Stone, Randi
May 1999
Abstract: This book is a hands-on resource that offers ideas, projects, and tips for elementary educators, including lesson plans, calendars and schedules, classroom discussion ideas, uses for new technology, and strategies for working parents. Each of the book's 12 chapters begins with a chapter overview, then offers a collection of articles by teachers who have practical suggestions to share. The chapters are as follows: (1) "Sharing Teacher Philosophies," (2) "Succeeding with Reading and Writing Instruction," (3) "Succeeding with Math Instruction," (4) "Exploring Science, Mathematics, and Technology," (5) "Threading Technology through the Curriculum," (6) "Opening Doors to Parent Involvement," (7) "Integrating Inclusion in the Classroom," (8) "Teaching Social Studies in the Elementary Grades," (9) "Celebrating Art and Music," (10) "Creative Scheduling," (11) "Experiencing Education Abroad," and (12) "Topic Smorgasbord: Sharing More Key Elementary Issues and Perspectives."

Applications of Technology to Linking Schools, Families, and Students.

Bauch, Jerold P.
1998
Abstract: Parent involvement is considered one of the most powerful means for improving schools and for increasing the satisfaction of parents and the community. However, barriers of time, schedules, and resources have put limits on effective parent involvement. To address these problems, telecommunications technology has been applied to increase parent-teacher interaction. Voice messaging ("voice mail") is now an established way to open schools to virtually all homes, using the telephone to assure easy connectivity. The Transparent School Model, the original plan for using these linkages, can produce a high level of school-home interaction and can give positive results in student performance and parent attitudes. New technology applications are also emerging, where computer devices in the home give access to the Web, the Internet, and other resources. As cable delivery and addressable set-top devices become more available, schools can become much more open to homes and the community. With a new integrated technology model to link schools, families, and students, the barriers and gaps can be reduced or eliminated. Parents could have their choice of several delivery channels, and teachers would be able to provide remote access to the learning experience of the child with modest additional time and energy. The use of current technology to link teachers and families is feasible, and the near future holds new means of information exchange between schools and homes.

Teachers' School-to-Home Communications and Parent Involvement: The Role of Parent Perceptions and Beliefs. Report No. 28.

Ames, Carole; And Others
April 1995
Abstract: This study is part of a longitudinal project examining the relationship between parent involvement and specific types of teacher practices, namely school-to-home communications. The study sample included 35 elementary school teachers from 4 midwestern school districts in small cities and rural areas, and a control group of 34 teachers from different schools in the same district. An intervention program was designed to increase teachers' use of home-to-school communication practices, and targeted the frequency, content and structure of these communications. The study evaluated the teachers' use of home-to-school communications from both the teachers' and parents' perspectives and assessed parent involvement from the parents' and child's perspectives. The study found that parents' overall evaluation of the teacher, their sense of comfort with the school, and their reported level of involvement was higher when they received frequent and effective communications. Children's motivation, attitudes toward parent involvement, and perceptions of their parents' level of involvement were more positive when their parents received frequent communications from the teacher. The findings suggest that helping
teachers develop a sense of efficacy for involving parents may be an important component in school-based initiatives that intend to encourage teachers to enact parent involvement programs. The findings also suggest that school-to-home communications seem to be related to the parents' level of comfort with the school and their perceptions of their child as a learner.

**Say "YES" to Telephone Lines in the Classroom. ERIC Digest.**

Lucas, Larry W.
December 1994
This Digest discusses the results of a survey on the installation and use of telephone lines in K-12 classrooms. A summary of the observations, comments, and opinions from teachers and educational administrators from around the world as well as references to conference presentations and printed articles about the subject are included.

**Dialogue and Communication between School and Home.**

Bauch, Jerold P.
1997
Abstract: This paper discusses school-home dialogue: its benefits; its theoretical underpinnings (Plato, Dewey, Hegel); perspectives on parent involvement, including societal changes that seem to produce barriers to communication between homes and schools (changes in family structure and role, time/schedule problems, distance, and educational bureaucracy); and the emerging role of technology. The paper describes experimentation with telephones as a way to bridge the information gap between teachers and parents, resulting in "The Transparent School Model" which uses a school-based computer system to provide voice mail linkages between teachers and parents. The paper claims the model goes a long way toward promoting the ideal of community achieved through dialogue between homes and schools, and addresses the barriers to communication described earlier.

**Making the Connection. An "Education Week" Special Report.**

January 10, 1996
Abstract: This document contains all of the articles from an "Education Week" special report examining technology's role in bringing schools and homes closer together. Articles include: (1) "Homeward Bound" (Peter West), about one of the nation's first "virtual teachers" and the effect of the changing dynamics of the telecommunications industry on electronic classrooms; (2) "Nerve Center" (Peter West), which details the successes and drawbacks of the Indian River Education Network (IRENE), an electronic bulletin board that allows a Florida community to gain access to school-related schedules, meeting minutes, and other information; (3) "Computer Geeks" (Peter West), outlining the increasing prevalence of computers and electronic information in the classroom; (4) "Home on the Web" (Peter West), about parent teacher association home pages on the world wide web and other ways of using the Internet to enhance communication between the school and the home; (5) "Home Improvement" (Megan Drennan), about a project whereby Bell Atlantic gave 135 inner-city seventh-graders at Christopher Columbus Middle School (Union City, New Jersey) their own home computers in order to gauge the effects of easy computer access on motivation, academic performance, and family awareness of school activities; (6) "Making It Work" (Peter West), about an entire precollegiate curriculum available online worldwide; and (7) "Equitable Pursuits" (Peter West), about a project which provides the disadvantaged with electronic links to community services and economic opportunities.
Excitement in Eight Schools: Schools, Families, and Students Get Stronger When Parents and Teachers Take Collaboration into Their Own Hands.

Hollifield, John H., Ed.
September 1995
Abstract: This report reviews recent initiatives to improve family-school collaboration and communication. The six articles are: (1) "Schools, Families, and Students Get Stronger When Parents and Teachers Take Collaboration into Their Own Hands," which highlights parent-teacher action research projects at eight schools through eight case studies; (2) "Parent Perceptions and Beliefs about School-to-Home Communications Affect Their Involvement in Their Children's Learning," which presents the results of study of the school-to-home communications practices of 20 teachers; (3) "Poor Rural and Urban Communities Examine Social and Emotional Needs of Their Very Young Children," which summarizes a study of the concerns of parents about preschoolers’ development; (4) "Improving Parent Participation in School-Based Programs," which describes an effective parent participation program; (5) "How Chinese-American Parents Support Their Children's Success in School," which summarizes a study on the educational attitudes of Chinese-born and American-born Chinese-American families; and (6) "Four Case Studies Examine Promising Integrated Programs That Empower Families."

Using a Computer-based Messaging System at a High School To Increase School/Home Communication.

Burden, Mitzi K.
1995
Abstract: Minimal communication between school and home was found to contribute to low performance by students at McDuffie High School (South Carolina). This report describes the experience of establishing a computer-based telephone messaging system in the high school and involving parents, teachers, and students in its use. Additional strategies employed to increase communication were: parent training; creation of a parent center in the school; teacher training; and increased school, home, and community interaction. Survey results at the end of nine weeks of system use indicated a positive increase in school/home communication and in provision of classroom information by teachers, although only one of six expected outcomes was achieved. Conventional surveys were subsequently used during the nine-month practicum period to assess teacher and student use of the messaging system. Electronic surveys assessed parent and community satisfaction with messaging systems as information sources. Appended are a caller directory/guide; survey forms for assessing system use by parents, students, and teachers; and scripts for conducting electronic surveys.

A Longitudinal Study of Patterns of Parent Involvement in School across the Elementary Years: Teacher and Parent Reports.

Roeser, Robert W.; And Others
April 1995
Abstract: Using three waves of a cross-sequential, longitudinal study of elementary school students, their families, and their teachers, this study documented patterns of use of parent involvement strategies across grades 1 through 6 using teacher and parent reports. The results indicated that, in general, teachers reported infrequent use of parent involvement strategies, with the exceptions of providing parents with basic information on classroom procedures, and providing feedback for negative student behaviors. In general, mothers corroborated these reports, indicating infrequent solicitations of direct involvement, but also reporting that they received fewer basic communications than teachers reported. Despite the lack of school-initiated efforts to involve parents, mothers reported quite frequent engagement with their children in reading activities in the early grades, and in other academic activities and educationally relevant discussions across the elementary years. Correlations between teacher and parent reports showed few significant relationships, suggesting either a communication gap between home and school, or a lack of parental acknowledgement of these practices due to their infrequency. An appendix contains teacher scales intended to measure parents’ educational involvement.
The Family-School Connection and Technology.

Blanchard, Jay
1998
Abstract: As an integral part of American life, technology is expected to accomplish a variety of tasks, including promoting the educational development of children. To accomplish this task, technology must deal with the challenge of connecting the two major institutions of learning for children: families and schools. Surveys indicate that while most Americans believe a strong family-school connection is important, they do not act to support that belief. Contemporary models of the family-school connection focus on a number of different factors and cover a multitude of investigative perspectives. Causal models focus on factors that directly or indirectly influence educational and social outcomes, while practices models refer to how families and schools work together to support student outcomes. Technology in both models has indirect effects on student outcomes. A number of projects have studied the influence of technology, including Project TELL, ThinkLink, Lightspan Partnership, and the Indiana Buddy System. Analysis of these projects indicates that technology can serve the family-school connection in four areas: (1) communication and information, (2) learning and instruction, (3) interest and motivation, and (4) resources and costs.

Increasing Teacher, Parent, and Student Involvement To Promote Student Learning and Self-Esteem.

Eilers, Janet L.; Fox, Judith L.; Welvaert, Mona S.; Wood, Jacqueline M.
1998
Abstract: This action research study examined the problem of the loss of commitment to schoolwork by middle level students as evidenced by missing assignments; late work, incomplete work, or both; and an attitude of indifference on the part of the students. The study also reviewed a variety of strategies to improve student learning and students' view of themselves as learners and to increase parent involvement in their children's learning. Participating in this study were seventh- and eighth-grade mathematics students in an economically and culturally diverse urban community in western Illinois. An examination of the percentage of missing, late, or incomplete assignments in 1996-97 for grades 7 and 8 mathematics classes revealed a relationship between missing, late, or incomplete assignments and low grades. Intervention strategies included cooperative learning and multiple intelligences activities, encouragement to increase responsibility for their own learning, increased teacher communication with parents, and new classroom management procedures involving parents. The effects of the intervention were assessed by means of surveys for students, parents, and teachers; grade records; parents' responses to written communications; student journals; and classroom observations. Post-intervention data indicated a modest increase in student achievement, increased confidence among students as mathematics learners, improved student self-image, and improved good will between home and school. Thirty appendices include data tables, questionnaires, and sample materials.

K-12 Computer Networking.

1995
Abstract: The "ERIC Review" is published three times a year and announces research results, publications, and new programs relevant to each issue's theme topic. This issue is intended to help teacher educators, administrators, librarians, adult educators, and individual teachers introduce others to education resources on computer networks. There are nine articles including: (1) "Teaching Teachers to Use Telecomputing Tools" (Judi Harris); (2) "Classrooms Online: How One Teacher Got Started" (Bonnie L. Bracey); (3) "The Internet and Acceptable Use Policies: What Schools Need to Know" (Kay Day and Lynne Schrum); (4) "Network Terms to Get You Through the 1990s" (Barak Stussman); (5) "Federal Initiatives in Educational Technology" (Barbara Reuben-Powell and Carol Boston); (6) "Online with ERIC" which describes AskERIC, the National Parent Information Network, and other ERIC gopher and world wide web sites; (7) "Selected Resource Organizations" (Barak Stussman and Michael Heeg); (8) "Selected Reading List" (Carol Boston and Barak Stussman); and (9) "Putting It All Together: An Action Plan" which presents tips for using computer networks and a list of selected listservs.
Increased Student Achievement through Parental Involvement and Increased Student Responsibility.

Boberg, Tim; Carpenter, Kerry; Haiges, Shelley; Lundsgaard, Barb
1999
Abstract: This action research project addressed the problem of missing assignments among fourth- and fifth-graders at a school in northern Illinois. In order to document the extent to which students lacked responsibility for turning in daily assignments, the teacher-researchers kept track of missing assignments for each student and grade book records for 6 weeks to establish a baseline. The school's entire teaching staff and all parents of the targeted students were also surveyed. An intervention was developed to increase the percentage of students completing assignments through: (1) parental involvement; (2) improved home-school communication; and (3) student interdependence. The intervention specifically involved an automated daily voice mail system to inform parents of school assignments, a cooperative peer support system with rewards for 100 percent completion of assignments, and a "Completed Homework Tally Sheet." Data from the tally sheets and a concluding parent survey indicated a slight (2 percent) improvement in timely homework completion. Only 32 percent of parents indicated they used the voice mail system, compared to 79 percent who said on the first survey that they would use it. Eleven appendices include survey materials and cooperative group checklists.

Beyond Academics: Home-School Collaboration To Promote Health & Learning.

Godber, Yvonne; Esler, Amy
October 30, 1999
Abstract: Families and schools are equal partners in the education of children, with both contributing in major ways. To succeed, their partnerships must be based on mutual trust and respect, with educators taking the lead in developing and nurturing effective collaboration with families. Overcoming barriers to partnerships means focusing on context, complexity, centrality, consistency, communication, and collaboration. Partnership principles include creating an open and friendly environment for parents, communicating with parents, and forging partnerships with all families. Trust building with parents involves predictability, dependability, and faith on the part of schools. Taking action to build trust involves focusing on such issues as: equal partnerships, power and social inequalities, cultural continuity, informal social events, and communication. Interacting with families requires maintaining a positive, honest orientation to all communication, ensuring that parents have all necessary information, and recognizing that trust takes time. The process of communication is influenced by dimensions of family-centered practice, including family orientation, positiveness, sensitivity, responsiveness, friendliness, and child and community skills. This paper includes a communications checklist, an action plan for strengthening home-school partnerships, and a sheet to help teachers examine what their partnership program will look like.

Parent, Family, and Community Involvement in the Middle Grades. ERIC Digest.

Rutherford, Barry; Billig, Shelley H.
October 1995
A research project that was focused on family and community involvement in comprehensive districtwide programs, school restructuring, and adult and child learning programs in the middle grades provided an opportunity to examine nine local sites that presented unique challenges for family and community involvement. Two central questions were explored at all sites. First, how do schools and districts involve families and the community as partners in education reform? Second, how do schools and districts create partnerships that acknowledge the roles of the family, school, and community in the growth of the child, and how do these systems interact? By synthesizing findings across all nine sites, researchers developed a set of eight "lessons" which enrich our understanding of the critical and complex nature of school-family partnerships in the middle grades.