

# **Web Site Functionality and the Learning Community**

## **Project Rationale Paper**

E-104 : The Theory and Practice of Web Pedagogies

### Table of Contents

Project Rationale Paper.....	1
Bibliography.....	19
Appendix A. (Figure 1).....	21
Appendix B. (Figure 2).....	22

Web sites serve multiple functions in the online community known as the world wide web. There are personal web sites that function like diaries or family photo albums. There are businesses online that compete as much for traffic to their web sites as traffic into their stores. Universities provide distance education through online courses. There are virtual rooms to meet someone new, or to chat with an old friend who is overseas. The web is packed with highly structured information in the form of pages of text, videos, sound clips, animations, images, and simulations, published to or protected from an audience as vast and varied as the offline world is, and just as curious as the learner in a teacher's classroom. In the case of a web site, however, there is significant distance between the "teacher", or web designer, and the "learner", or user, called transactional distance. As Michael G. Moore points out in his theory of transactional distance, "...in a highly structured educational programme, the objectives and the methods to be used are determined for the learner, and are inflexible." A web site is a highly structured environment in which the learner is a user who seeks information through a fixed interface. Just as "...teachers must appease multiple constituencies, including students, parents, administrators, politicians, business people, and taxpayers, not to mention their own personal values," so must web designers build a web site capable of accommodating an array of participants in a fixed environment. (Wiske, 67) The challenge is to target selected portions of the population in the hopes of successfully capturing their interest and support. The success is directly linked to the selection and arrangement of content, the user interface, and the cyclic system of innovation used to develop the web site.

Daniel Aronson says "one powerful way to increase the benefits of innovation efforts is to target them so they result in innovations that are more strategically useful and thus have greater benefits for the organization." (Aronson, *How Systems Thinking Can Improve the Results*

*of Innovation Efforts*) My goal in this project is to design a web site which serves to benefit the organization of a high school learning community. The challenge, from a systemic approach, is to choose carefully the efforts I put into the design so that its functionality benefits the multiple target audiences of the site, and therefore benefits the school community as a whole. Systems thinking "...focuses on how the thing being studied interacts with the other constituents of the system – a set of elements that interact to produce behavior – of which it is a part." (Aronson) Just as the web site itself is broken down into its interrelated sections, the cycle of innovation, or system, to develop the web site is broken down into its interrelated parts; sources, design, delivery, interaction, and the learning environment (Appendix A, Figure 1). Each one of these components, as indicated by the arrows in Figure 1, affects another, so that any change in one part of the system necessitates an adjustment in any or all other parts of the system. A consistent and effective cycle of innovation emerges when the systems approach is applied to the project, which results in a richer analysis of the large number of interactions and feedback from the sources.

Web sites for K-12 schools serve multiple functions within a learning community. School web sites function as both a showcase of the teaching and learning accomplished in the school's community, as well as a tool to enhance teaching and learning in the classroom.

As an example of the interrelationship between a school's learning community and its web presence, I updated a Boston Public High School's web site, that of TechBoston Academy. Specifically, I added a "Teaching and Learning" section, a "Classes at TBA" section, and a "Student Center", in the hopes that such additions to the school's web presence would expand its existing learning community onto the world wide web, enhance teaching and learning at TechBoston Academy through the use of the web site, and strengthen relationships between

students, teachers, parents, administrators, investors, and neighboring community members as a result of their interactions with the web site.

TechBoston Academy is a two year old pilot school in the Boston Public School System and a Gates Foundation Model Secondary School project. The primary goal, or "bigger picture", of TechBoston Academy is to improve learning with and through technology. Its headmaster and founder, Mary Skipper, leads the way with her vision. Funding and sponsorship drives the school financially. And the publicity of positive innovations in the teaching and learning accomplished at the school by its staff and students feeds the motivation and momentum. All eyes are essentially on TechBoston Academy to see how technology can improve teaching and learning in the Boston Public School system, and possibly beyond the Massachusetts Department of Education.

In order for TechBoston Academy to succeed, it needs to gain sufficient support from a variety of sources (Appendix A, Figure 1). TechBoston Academy needs to be properly funded, so investors need to be impressed. It needs to attract and retain high quality staff and interested students. It needs to show educators that learning has indeed improved with the innovative curriculum developed by its staff. It needs to build stronger connections between parents and their child's academic and social development. It needs to help improve neighboring communities with student service and employment. Collectively, the target audiences of the web site comprise the TechBoston Academy community. Normally, many of these members do not all interact other than online, and even then, may not be aware that they are simultaneously influencing the same system.

It is therefore crucial for TechBoston Academy to record, reflect and reference its maturation as a learning community in order to prove progress and stabilization to investors,

parents, students, neighboring community members, and educators. Among the many types of traditional marketing materials produced to deliver these kinds of messages, the web site becomes a primary medium to satisfy the needs of the TechBoston Academy community. Content within the web site is delivered through a variety of media including text, audio, video, imagery, simulation, animation, and web tools. The web site serves as a showcase of the teaching and learning accomplished at TechBoston Academy, and as a central hub of communication between TechBoston Academy's multiple audiences.

Tension results when multiple audiences of people with a variety of needs share and contribute to the same resource. As can be seen in the systems diagram (Appendix A, Figure 1), TechBoston Academy administration, parents, and students, investors, educators, and the neighboring community will complement and conflict through their interactions with the web site. Each audience will bring different expectations to the same parts of the web site, which causes conflicts and compromises in the selection and arrangement of content. For example, the TechBoston Academy teachers agree that all of the student portfolios should be posted on the web site. The TechBoston Academy administration, who desire to impress investors, want only a selected set publicized on the web, and that this set be free of mistakes. The investors want to see high quality academic work from students at TechBoston Academy as evidence of the high academic standards achieved there from innovative teaching. Teachers argue that a student portfolio shows a student's "best" work, although not necessarily perfect in grammar and spelling, does show progress made over the course of the year. And progress, according to the teachers, is more reflective of learning than a perfect final product. The compromise in the design is to post the selected "best" portfolios on a top level web page of the "Digital Portfolios" section, and archive all the others in a sub page. This scenario shows how important the feedback



college for all students (<http://www.gatesfoundation.org>). What Kids Can Do, a non-profit organization that posts student work and voice from around the nation (<http://www.whatkidscando.org>), had recently launched a new web site, Student Learning in Small Schools: An Online Portfolio (<http://www.whatkidscando.org/portfoliosmallschools/portfoliohome.html>). This digital portfolio highlights student learning in four small schools which have received funding from the Gates Foundation to spread nationwide their distinctive approaches to teaching and learning. These schools additionally receive support and assistance from the Small Schools Project (see <http://www.smallschoolsproject.org> ) in conjunction with the Gates Foundation. The main goal for TechBoston Academy, which is primarily funded by the Gates Foundation, is to be included in the small schools portfolio, and therefore continue to receive annual funding from the Gates Foundation as well as gain new support and publicity from the Small Schools Project.

The Small Schools Project states “We believe the quality and depth of a student’s work tells us more about her learning and what she can do, than test scores. Student demonstrations of work are also a way to be clear as a community about the standards we expect students to reach by the time they graduate and to publicly show work which reflects these standards.” (<http://www.smallschoolsproject.org/index.asp?siteid=smallschools&section=cando>) The new “Teaching and Learning” section on the TechBoston Academy web site, therefore, needs to show examples of student work that represented the standards of excellence and achievement held at TechBoston Academy. These examples include that of integrated curriculum projects, digital portfolios, real world learning, and youth media. These categories were selected based on studying the structure of the four small schools featured in the online portfolio, as well as collaboration with TechBoston Academy staff. Curriculum integration involves reshaping

learning activities to help students see connections between topics and make learning more meaningful to students. Real world learning at TechBoston Academy includes placing students in internships, after-school programs, and specialized projects that apply their academic lessons to real world scenarios. Digital portfolios are a showcase of student work and progress in the classroom over the course of an academic school year. As a part of their learning experience at TechBoston Academy, students are encouraged to create their own messages and stories, report and reflect on school, community, and global issues, and share their personal experiences through digital imagery in the “Youth Media” subsection.

A second section of the web site, the "Student Center", is a forum for posting of independent student work and voice, and basically mirrors the “Youth Media” subsection of the "Teaching and Learning" section in content, but should be more appealing to high school students in its presentation and more student-driven in its content creation. My goal with this section is to provide a safe and engaging online space for TechBoston Academy students to interact, learn about each other, and express themselves with the tools and skills they acquire in class. Visitors to this section get a better sense of what kinds of students attend TechBoston Academy. “The liveliest and most powerful work today gives young people the tools not only to be critical media consumers but also to create their own messages and stories.” ([http://www.whatkidscando.org /WhatsLearned/YouthMedia.html](http://www.whatkidscando.org/WhatsLearned/YouthMedia.html)) With the ever-increasing attention paid to the media in today's society, teens are especially influenced by the messages targeted at them. As a part of their learning experience at TechBoston Academy, students are encouraged to create their own messages and stories, report and reflect on school, community, and global issues, and share their personal experiences through digital imagery. Youth media in

the “Student Center” should empower TechBoston Academy students to express themselves in a constructive and positive way using the skills they learned in the classroom.

Finally, a "Classes at TBA" section will be built in which each teacher has his/her own class web page. This section emerged in response to the staff’s request for a web interface to their classrooms. Here, teachers may post assignments, announcements and resources for use in their classes. Access to grades and assignments would allow parents to check in on their child’s progress and contact teachers with concerns and questions. In this way, parents would become more involved in their child’s learning experience at TechBoston Academy.

In the cyclic process of design, delivery, and interaction within the system, a number of challenges arose, each driven by as well as solved by the affordances of the technology available to me.

The design process remained consistent throughout the project. The web site was originally built using templates and style sheets in Macromedia Dreamweaver. I inherited the working files and set up an offline mirror of the site to work off of my own laptop. Once completed with an update, I posted the files onto a development server and tested the site internally. Upon approval, an email was sent to the administrator of the live server, and he moved the new files over to the live site for final deployment.

The first challenge immediately brought to my attention during the design process was the restricted access to the server on which our site is hosted. At present, only I have an account at TechBoston Academy that gives me access to the port on the development server. Here, a mirror of the live web site is kept unseen to the world. It is also, however, unseen to anyone who is not logged into the account. Therefore, if I make updates to the development server, no one can test and approve/disprove my changes before making them live. Secondly, access to the

development server is restricted while I am at school. Only one account can access the development server at one time. So if someone else in the TechBoston domain is accessing the server, I am not allowed in. Some days I cannot get in at all. Lastly, once I do make updates, I have to email the administrator of the TechBoston server and ask him to port the updated development files over to the live site in order to make the changes live. This obviously destroys any chance of quick updates as well as any way for students to directly contribute to the development of the web site. I met with the TechBoston IT staff to address my concerns and needs for next year. The server is being moved and updated this summer and will be easier to maintain next fall. Additionally, students will be able to contribute to the development of the web site with the achievement of a student accessible development server. My vision is to give a selected group of students as much responsibility and care of the TechBoston Academy web site as possible to increase their learning experience. At my request, traffic reports were added to the server.



been placing various assignments and resources in their network drives, but not providing an interface to lead students to specific documents. Therefore, a web site would afford students an easier way to find what they needed for a class, and allow teachers to organize their class files.

The next challenge I faced was deciding how to build the class web sites in a way that was (a) not too much work for the teachers to maintain and (b) a learning experience for the students. I chose Dreamweaver because we had just purchased a site license and made a commitment to using it as the web authoring software in our IT classes. Dreamweaver also affords the use of templates which keeps all class web sites looking similar and therefore less confusing to students as they navigate from class to class. Dreamweaver's site management tools afford me the ability to integrate the class web sites later on into the live web site, which is also done in Dreamweaver. I assigned one sophomore student as the webmaster of a teacher's class web site. For example, Sharnique was the webmaster of Mr. Floyd's 9th grade math class web site. Sharnique's responsibility was to build the site on Mr. Floyd's network drive with the content he provided her, and coordinate with him on an updating schedule. Read/Write/Modify permissions had to be set for the webmasters and lessons on templates, style sheets, and file management in Dreamweaver were required.

After providing the teachers with a webmaster and a timeline of tasks, issues arose among the teachers. Some wanted to work on their web sites themselves. Some did not have time to work with their webmaster. Not all of them felt comfortable using or learning how to use Dreamweaver. I realized that no matter which tool I chose, not every teacher would be comfortable with it and may even refuse to learn how to use it. OIT provides classes which train teachers in technology tools. Yet nearly every year, few if any teachers sign up to attend them. I began to wonder, are teachers uncomfortable with technology alone or rather uncomfortable with

changing their currently successful methods of teaching? I tried to allay concerns by emphasizing that this was phase one of the class web sites and that further capabilities would be developed once an advanced teaching tool was purchased. The intranet solution was a short term solution to the immediate need for class web pages.

Not long after the final phase of the class page intranet project, a teaching and grading tool by Edline (<http://www.edline.com>) was purchased by the administration. Edline is a complete Internet web hosting solution that will serve as a password-protected extension of the TBA web site. Edline allows teachers to populate class web pages instantaneously from anywhere, enhances parent-teacher communication, publishes grades in conjunction with its grading tool, GradeQuick™, and targets information based on each visitor's assigned user level. Clearly Edline affords the teachers far more advanced capabilities than an offline static web site does. This new tool will be used by all teachers in the fall of 2004, and linked to from the "Classes at TBA" section of the TechBoston Academy web site.

The final challenge I encountered during the project involved content creation. Each section and subsection of the site depended on content developed by multiple sources. The management and motivation of these sources was critical to the completion of the project. Content for the "Teaching and Learning" section included collecting lesson plans, rubrics, and projects from the teachers. One staff member served as point person and provided me with organized materials for posting. Content creation for the "Student Center" depended on the interests and motivation of the students, and contribution from neighboring community members. Students were asked to volunteer their extra time to contribute to the school's online newspaper. The class web pages, after initially built by students as a graded assignment, were

then maintained either solely by the teacher or through the continued partnership of a student and a teacher.

In the end, the need for so many sources to collaborate on the project actually increased the offline interaction of administration, teachers, students, and neighboring community members. The learning environment of the system thus expanded out of its “fixed” setting on the web and into the more flexible and intimate environments of the classroom, home, and community based organizations (Appendix A, Figure 1). In this way, both the process and the final product enhanced teaching and learning and may have strengthened or forged new relationships within the TechBoston Academy community.

The overall design strategy requires asking "when will this web site pay off?" How do I know that the design is indeed successful and that the community understands the value of a web presence? By applying the teaching for understanding framework to the project, a model of “participating for understanding” emerges. Users participate, or interact with the web site in order to gain knowledge, and in turn demonstrate their new knowledge through offline ongoing performances of understanding. The user is asked to do something that “puts the understanding to work.” (Perkins, 41) The web site is not a course, yet still there are specific goals that each user should understand after their interaction(s) with the web site. In addition, there are topics generated from each section of the web site. Users perform their level of understanding offline, and see their feedback get incorporated back into the design cycle when changes are made to the site. Just as “...teachers must select the substance and adjust the shape of curriculum to meet the needs of their particular students,” so must web designers develop a web site capable of meeting the needs of its participants. (Wiske, 63) If the system of innovation is in fact conducive to the feedback from its sources, the site, although always a fixed learning environment in real time,

will adjust to its users' needs in subsequent phases of redesign. In this way, a teaching for understanding approach is achieved when systems thinking

Each section and subsection of the web site generates topics users may inquire about when they visit, and hopefully understand by the end of their interaction. Some topics may be of more interest to one user than to another. In the "Teaching and Learning" section, visitors to the "Integrated Curriculum" subsection, such as educators, most likely want to know how teachers collaborate on learning activities across the curricula. The goal in this section is to educate teachers outside of the TechBoston Academy community about best practices and successful projects, and to turn their curiosity into application in their own classrooms. Users browsing the Digital Portfolio subsection can view examples of how students are progressing academically from year to year and what level of academic excellence they are held to. Visitors to the "Real World Learning" section of the web site can learn how TechBoston Academy students are applying their academic lessons to real world scenarios and bettering their community with service and employment. Neighboring community members, impressed with the display of skills and character in the student body, may offer them employment, service, and/or continuing education opportunities. Users can learn about the variety of individuals in the student body by browsing the "Youth Media" space and "Student Center", and learn how students express themselves using the skills they have acquired in class. Potential students and parents may browse this section when they are investigating different high schools. The goal is to evoke in TechBoston Academy students a sense of school pride and develop an awareness of its public presence and what that means to the school. Additionally, students learn from and about each other by seeing benchmarks of achievement among their peers or discovering characteristics of classmates they had not known before. Users, such as educators and parents, interested in the

types of classes offered at TechBoston Academy can visit the “Classes at TBA” section, while current students and parents can access class resources in the class web pages. The goal is to help students become better prepared for class and more skilled with web tools, and to ease and increase communication between parents and teachers. Teachers, in turn, will recognize the value the web site adds to their classrooms, and the administration will understand the importance of a web presence to investors and stakeholders. Throughout the web site there is a variety of perspectives presented, as a result of the contributions to the content from multiple sources.

The web site does not offer an online environment in which its users interact with each other. They can email staff, but are never aware of each other’s interactions with the site at any time. They interact with the web site mainly by surfing. Other than traffic reports which indicate an increase in the number and frequency of visitors to the web site (Appendix B, Figure 2), the performances of their understanding of the learning goals are done offline. Performances of understanding require the users to go beyond the information offered on the web site and create something new by using what they already know; “The performance view emphasizes understanding as the ability and inclination to use what one knows by operating in the world.” (Wiske, 72) Additionally, performances of understanding allow students to take responsibility for their own learning; “it requires teachers to relinquish their role as sole arbiter of excellence and to negotiate intellectual authority with their students.” (Wiske, 81) For example, the “Student Center’s” newspaper is a web tool which allows students to contribute to the development of published work through peer-to-peer editing and hands-on site building. When students voluntarily submit work to be included in the school newspaper, and revise it to the standards of publication required, it is shown that they understand the difference between published work and

works in progress, that they take pride in the skills they have acquired at TechBoston Academy, and that the “Student Center” is a public forum to express themselves and display their achievement at the school. Both the administration and the student body become more aware of the new learning opportunities that emerge from a web presence when neighboring community members reach out to the school to recruit its students for service and employment opportunities. After the first issue of the school newspaper was launched, I received a phone call from Allied Agency, a Boston-based publicist for Paramount Pictures, who, after searching online and seeing the Entertainment section of our online newspaper, invited the newspaper staff to a free pre-screening of a movie and an interview with the movie’s co-star, for use as material in the next issue. In another scenario, the administration shows their understanding of the value of a web presence in acquiring support when I am asked to present the web site to stakeholders such as the Executive Director of Education for the Bill and Melinda Gates Foundation. When teachers build learning activities into the classroom which involve an interaction or contribution to the web site, they show their comprehension of the value of the site to enhance teaching and learning at TechBoston Academy. For example, the 9<sup>th</sup> grade English teacher will assign an editorial piece which requires students to write reactions to the Editorial section of the online newspaper. When the class web pages are launched and connected to the school web site, teachers who continuously update their class web sites show their understanding of the value of an online method of organizing and delivering their class materials. Parents who log in to the “Classes at TBA” area and contact teachers will have understood the efficacy of the online class web sites. Lastly, a consistent and/or increase in traffic to the web site will be an ongoing assessment of the success of the selection and arrangement of content, the user interface, and the cyclic system of innovation used to develop the web site.

The TechBoston Academy web site continues to cycle through its system of innovation and reflect the simultaneous growth of TechBoston Academy. In its future cycles of development, I see a number of changes that would further integrate the web site with enhancing the teaching and learning at TechBoston Academy. There are many collaborative web tools available that would increase the interaction of community members. For example, a discussion board could be added in which reactions to the editorials published in the newspaper could be posted and discussed in an activity in English class. Online polls and surveys could be run and evaluated in Math class. Administration wants a school book and merchandise store both online and offline. I see the “Youth Media” section and the “Student Center” growing further apart in their presentations of similar content. The students say that the web site is "boring" and that the “Student Center” needs "cooler stuff." The “Student Center”, therefore, should be made more "teen-friendly" with interactive web tools and a youthful theme, while the “Youth Media” section remains targeted to investors and stakeholders in its professional presentation. The current process for creating and passing in portfolios is inconsistent and laborious from year to year. An online tool, much like the ASNE tool, for building, archiving, and posting the digital portfolios would be an excellent addition. The determination of public and private areas of the web site would ease tension between teachers and administration on the types of student work posted on the web. Public sections would be more polished for external visibility, whereas password-protected sections would be designed for internal use and works in progress. The “Classes at TBA” section needs to be launched with links to the respective class web pages which will be made in Edline. A “Parents Place” should be added that focuses on addressing any of the parents needs. Lastly, as more examples are added to the "Teaching and Learning" section

and subsections, a further breakdown of the classification of these examples may be necessary for ease of navigation.

The challenge is to target selected portions of the population in the hopes of successfully capturing their interest and support. The success is directly linked to the selection and arrangement of content, the user interface, and the cyclic system of innovation used to develop the web site.

In conclusion, the expansion of an online presence provides a learning community with a powerful tool to enhance teaching and learning. The web site becomes a reflection of the academic standards held at the school, the character of the student body, the curriculum of the teaching staff, and the mission of the organization. The community understands how to look critically at its own reflection and provide feedback that can benefit an individual member and/or the entire organization. Furthermore, the combination of the systems approach and the teaching for understanding framework affords a cycle of innovation that deals effectively with the challenge of building an online learning environment that meets the needs of so many different types of users. “One of the key benefits of systems thinking is its ability to deal effectively with just these types of problems and to raise our thinking to the level at which we create the results we want as individuals and organizations even in those difficult situations marked by complexity, great numbers of interactions, and the absence or ineffectiveness of immediately apparent solutions.” (Aronson, *Introduction to Systems Thinking*) The web site will continue to grow as long as the cyclic system of innovation remains in place, the project designer continues to be receptive to the users’ needs, and the organization shows its ongoing understanding of the value of the multiple functions of the web site in a learning community.

## Bibliography

Aronson, Daniel. *How Systems Thinking Can Improve the Results of Innovation Efforts*.

Worldview & Economics: A Systemic Analysis. copyright 1994 Daniel Aronson.

Aronson, Daniel. *Introduction to Systems Thinking*. Worldview & Economics: A Systemic Analysis. copyright 1994 Daniel Aronson.

Moore, Michael. G. and Kearsley, Greg. *Distance Education: A Systems View*. Wadsworth Publishing Co. November, 1995.

Perkins, David. *What is Understanding?* Teaching For Understanding. Chapter Two. Teaching For Understanding : Linking Research with Practice Editor(s). Martha Stone Wiske (editor). October 1997. Jossey-Bass.

Torenvliet, Gerard. We Can't Afford It! Interaction. July and August 20, 2003.

Wiske, Martha Stone. *What is Teaching for Understanding?* Chapter Three.

Teaching For Understanding : Linking Research with Practice Editor(s). Martha Stone Wiske (editor). October 1997. Jossey-Bass.

**What Kids Can Do.** <http://www.whatkidscando.org>

## **Bibliography**

**TechBoston Academy** <http://www.techbostonacademy.org/>

**Small Schools Project** <http://www.smallschoolsproject.org/>

**What Kids Can Do Small Schools Online Portfolio**

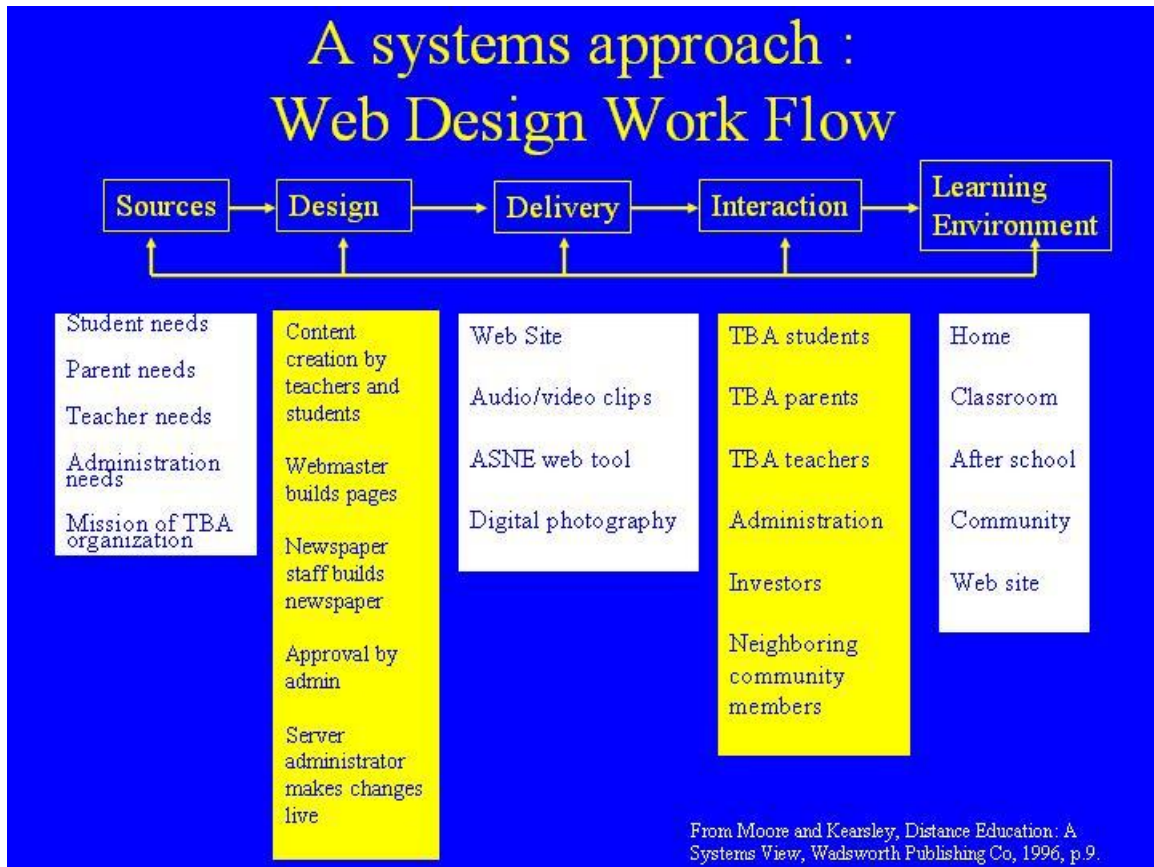
<http://www.whatkidscando.org/portfoliosmallschools/portfoliohome.html>

**Bill and Melinda Gates Foundation** <http://www.gatesfoundation.org>

**American Society of Newspaper Editors** <http://www.asne.org>

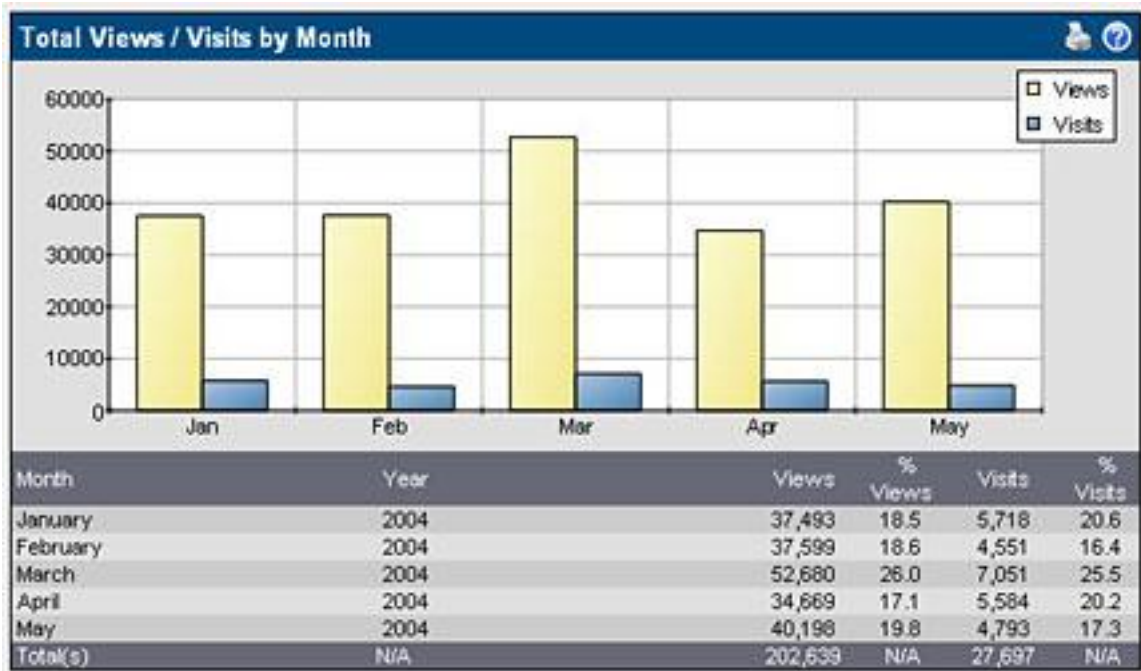
**My High School Journalism** <http://my.highschooljournalism.org/>

**Appendix A.**



**Figure 1. A Systems Diagram**

**Appendix B.**



**Figure 2. Monthly Traffic Report**