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The Current and Potential Value of Faculty Web Sites

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Abstract

The Education faculty web sites of ten institutions similar in size were examined to determine how many faculty have up-to-date web sites, the purpose(s) of the sites, and the content found on faculty web sites. Results indicate less than 20% of Education faculty maintain a web site, and that the primary purpose the web site serves is an electronic Curriculum Vitae.

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A recent school-wide web redesign effort led to the researcher examining education faculty websites. Although most of the twelve School of Education faculty have a website of sorts posted, three do not, and three are badly (as much as ten years) outdated. One is basic information that has not been updated in three years, one consists of a great deal of personal and professional information, but also has not been updated in several years, one is elaborate and detailed and has been updated recently, and three are current but contain minimal information.

When the subject of faculty websites is broached, all the faculty agreed an up-to-date website was something they wanted, but point to factors such as the lack of appropriate web editing software, and training to create or update their site. Indeed, support for faculty web pages is sparse. There are only two people in a Web Services department to support the entire campus, and a variety of webpage editing software is in use, including Netscape, FrontPage and Dreamweaver, with few organized classes or training for any of these programs.

In an effort to help Education faculty develop and update their sites, I wrote and received a grant enabling each SOE faculty member to own a copy of Contribute web editing software. Contribute is so easy to use our IT department does not even offer training on how to use it, claiming one can learn the program in a few minutes. Contribute seemed the best alternative to the more expensive Dreamweaver, and the obsolete Netscape and FrontPage.

However, copies of Contribute purchased for faculty have gone largely unused this year. The availability of easy-to-use web editing software has not resulted in change; no new faculty sites have appeared and few updates on existing sites can be found.

After the removal of barriers such as software and training, faculty were again asked why they are not posting and updating professional web sites. The answers included lack of time,

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expertise, training, and support, and finding no real reason to create a web site. Faculty expressed a desire for someone to sit next to them in their office and show them step by step what to do, yet when offered the chance for this, did not find time to meet with the support person. In general, faculty at my institution do not perceive a strong enough reason to have a current website to go to the effort to create or maintain one. There is no difference between new and more senior faculty in this regard at my institution. New faculty are slow to post a web site, while senior faculty have let their websites become badly outdated.

I began to wonder; "Is the situation similar in other Education departments? Do other institutions have impressive, up-to-date faculty web sites? Or are they like us, struggling with limited time and resources?" A review of the literature in this area offered some answers, and raised further questions about faculty web pages.

Literature review

Previous research indicates 10-12% of faculty have professional web sites accessible from the department site (Bee, 2000; Lennex, 2007). One study reports that over half of students say faculty rarely or never have their own web sites, and only 17% of faculty often or very often have a web site (Wang, 2007).

A recent study examining the currency of faculty web sites found many outdated pages, and the researcher speculates that some sites had not been updated since their original creation at a long ago workshop session (Lennex, 2007). Some authors write about the need to maintain a personal web site, keeping it current (Heiberger & Vick, 2002; Stern, 2000). An outdated website may reflect negatively on the faculty and the institution, yet little research examines if faculty web sites are kept up-to-date after their initial posting.

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The literature discussed several purposes for faculty web sites. Moor and Zazkis (2000) report the use of web sites as “virtual offices” (p. 92). Faculty post assignments, syllabi, lecture notes, and grades to the web site. “Some virtual offices allow students to hand in assignments through the Internet and receive feedback on these assignments via electronic means” (p. 92). This early use of faculty web sites seems to be met today by Course Management Systems (CMS) such as Blackboard.

Faculty web sites have been described as a socializing mechanism, as they can communicate information to students such as instructor goals, beliefs and attitudes toward teaching and learning (Wang, 2007). A web site can also be a way for students to get to know their professors, however, Kreis (1998) writes that few faculty “Web sites go so far as to discuss the professor as a unique individual” (¶ 2). Students need to understand why faculty teach in order to promote approachability and foster a personal relationship with the instructor; and “…in the interests of student motivation and success, professors ought to be more willing to let their students partake of at least a glimpse of their private world” (Kreis, 1998, p. 5).

Researchers identify elements they believe should be present on all faculty web sites. Lennex (2007) states that the goals of the web site should be to offer “access to course and program information, links to university resources, and contact information for the professor” (p. 33).She administered a survey to students to determine those elements which are linked to “best practice and usability” (p. 33). The elements identified include hyperlinks to and from the department site, faculty email address, syllabi, subject area resources, current office hours, and an anonymous sender form for feedback. Other researchers suggest faculty web sites include name, contact information, links to departmental and institutional web sites, a brief description of

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research interests, Curriculum Vitae (CV), publications, a link to scholarly organizations, syllabi and course materials (Heiberger & Vick, 2002). Palmiter & Renjilian (2003) identified the elements both faculty and students believe should be present on a faculty web site as an email address, office hours, telephone number, course syllabi, courses offered, research interests, educational background, links both within and outside the institution, professional experience, publications, academic advising information, professional memberships, and a picture of the faculty member.

Stern (2000) identifies different types or categories of faculty web sites. A web site designed to deliver and support a course can act as a CMS or as a supplement to instruction for online or face-to-face classes. These sites typically contain syllabi, lecture notes, and bibliographies, and may contain gradebooks, chat rooms and grading information. Stern refers to another category as the "business card page", one which contains only basic information such as faculty's title, affiliation, contact information and perhaps a photograph. The last type of web page is one Stern calls "idiosyncratic personal sites". This category includes web sites which promote consulting work, as well those with personal information about the faculty, such as hobbies or family photos. Some benefits of personal sites include "putting a face and personality on an institution, marketing the institution, and providing more information about faculty than business cards sites" (Stern, 2000, p. 6).

The literature review reveals that articles which examine faculty web sites include information about the types, purposes, and benefits of faculty web sites, list desirable elements for inclusion on web sites, and identify how many faculty have professional web sites. Academic

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faculty web site research is scarce; indeed, most took place in the late nineties and early 2000's. Recent research is nearly non-existent.

Theoretical Framework

The issues of faculty adoption, use and ownership of new technologies are well grounded in technology adoption theories such as Rogers' Diffusion Theory, The Technology Acceptance Model, Perceptual Control Theory, the Concerns Based Adoption Model, and The Learning/Adoption Trajectory model. Adams (2002) writes that "Rogers' (1995) diffusion of innovations and Hall, Wallace and Dossett's (1973) Concerns-Based Adoption Model (CBAM) are two widely accepted models developed to describe the change process" (p. 286). Rogers' theory examines the acceptance of an innovation by a group of users, noting that characteristics of the innovation influence how widely and deeply it is accepted. These include the innovations relative advantage over its predecessor, compatibility with the adopter, ease of use, if the adopter can experiment and use the innovation on a limited basis, and the visibility of the results of adopting the innovation to others (Hansen & Salter, 2001).

The Technology Acceptance Model (TAM) examines the innovation's ease of use, and the perceived usefulness of the technology, to predict adoption levels (Davis, 1989). Ease of use involves the amount of time and effort a user needs to expend to initially learn the technology, and to maintain use. The usefulness of the technology relates to how it will help the innovation or adopter improve their job performance, such as teaching (Heijden, 2000). The model is similar to Perceptual Control Theory (PCT), which examines how the adoption of technology helps teachers achieve their goals (Zhao & Cziko, 2001). PCT looks at three considerations for teacher technology adopters; that technology meets a goal more effectively than what is in use now, that

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it does not cause disturbances, and that the user believes she will have the ability and resources to use the technology (Zhao & Cziko, 2001).

The CBAM Stages of Concern describe how users of the innovation perceive the innovation, and concerns they might have in adopting it (Adams, 2002; Brzycki & Dudt, 2005; Sahin & Thompson, 2007). CBAM identifies levels of innovation use, such as non-use, orientation, preparation, mechanical use, routine, refinement, integration and renewal (Adams, 2002; Brzycki & Dudt, 2005; Sahin & Thompson, 2007). CBAM recognizes that there will always be non-users of a technology, in contrast to Rogers' model which classifies the lowest level as laggards, implying that given enough time they will adopt the innovation (Adams, 2002; Durrington, Repman & Valente, 2000; Hansen & Salter , 2001).

The Learning/Adoption Trajectory model of technology adoption utilizes a cyclical rather than linear approach to stages of technology adoption by teachers. Several stages are identified; Teacher as Learner, Adopter, Co-Learner, Reaffirmer/Rejecter, and Leader (Sahin & Thompson, 2007). This model describes learning about the innovation as an ongoing process, and recognizes that some users will reject the technology after adopting or attempting to adopt it, and eventually cease to pursue use of the innovation.

Several of the models recognize that adoption of a technology may be an ongoing process, rather than a one-time effort. In addition, the models and theories of technology adoption indicate faculty may examine a technology innovation, try it out, and then choose not to adopt it. Possible reasons for rejection include barriers to initial and ongoing use, the perceived difficulty involved in learning and applying the technology, and the lack of a clear connection between use of the technology and meeting faculty goals, such as improved teaching.

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Technology adoption theory guided the formation of the research questions. The researcher wanted to determine the prevailing adoption level of faculty web pages, and determine how the creation and use of faculty web pages help faculty meet professional goals. The final research questions became: What percent of Education faculty at comparable institutions have web sites, and how up-to-date are these sites? What purposes do faculty web sites serve? What information is included on the sites? Do faculty administrators such as Chairpersons set an example by more often having sites posted than other faculty? Is there a correlation between faculty rank and having a web site? No previous research has examined faculty use of web sites among comparable institutions, within one professional area; a gap this study will address.

Methods

Answers to the research questions were determined by examining Education faculty web sites at comparable colleges and universities. Institutions of similar size were chosen, as larger institutions probably have more training and support available for faculty, and smaller institutions less, which could influence how many faculty have up-to-date web sites. Hawkins and Rudy (2006) report that “Most types of [IT] support reported for faculty use in teaching and learning differed significantly by Carnegie class” (p. 31).

The Carnegie Classifications Data File online listings was downloaded from http://www.carnegiefoundation.org and sorted first by enrollment and then by classification. My university is classified as (20) Master's S: Master's Colleges and Universities (smaller programs). There are a total of 127 institutions in this classification (Carnegie Foundation, 2008). The institutions selected for comparison are those which have total student enrollment within 500 students of my institution (500 students more or less). Of the 11 with similar enrollments, one

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was eliminated as it does not have a Teacher Education department, leaving a total of 10 institutions (including mine) in the comparison pool.

At the 10 institutions, each Education faculty web site was closely examined, and data collected and recorded. All tenure or tenure track faculty were included, and administrators were included in the study if they were also identified as faculty. Therefore a Dean without teaching responsibilities was not included, while a department chair teaching at least one class was included in the study. Adjunct, visiting, and other non-tenure track faculty were not included. Faculty web sites were examined to determine the presence of elements such as faculty email address, and for currency. The elements chosen for examination were those identified by previous research as desirable on faculty web pages, such as email address and office phone number. To determine currency, the most recent year found on the site was considered the last update. None of the sites indicate they were last updated on a certain date, but some sites gave listed current publications or conference proceedings, and some had syllabi posted with a semester date. Elements and other information were recorded in an Excel spreadsheet. Excel was also used for data analysis and calculating descriptive statistics.

Inspection revealed the need to clarify the definition of a faculty web site. For the purpose of this research, a faculty web site is defined as one hosted by institution servers, accessible from the College of Education, School of Education or Education department web site, and individualized by faculty. It became necessary to clarify the definition because some institutions have a campus-wide Faculty/Staff directory that often contains basic information about faculty, such as rank, contact information, department, and photograph. These appear to be

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generated by a centralized IT or web support department rather than created by faculty, so were not counted as faculty web sites for the purpose of this study.

Some institutions used templates for faculty web sites, with a common design and areas allocated for educational background, research interests, and publications. As these required faculty input and customization, template-based sites were counted as faculty web sites.

The classification types:

- Web Site (WS) – template based or original design. Generally consist of multiple pages.
- Enhanced directory (ED) –These are one page standardized templates to which faculty add information. These were counted as web sites if they originated from the Education department.
- Directory – these consisted of basic contact information, did not originate from the Education department, and were not counted as faculty web sites.
- Course Web Site – designed to support a course with little information about faculty. These were counted as faculty web sites as they were created by faculty and accessible from the Education department web site.

Results

Table 1 addresses the research question concerning how many faculty members have posted a web site. At the ten institutions examined, one hundred forty-four Education faculty members were identified for this study. The institutions are listed in order of enrollment; Institution 1 is the smallest in terms of student enrollment, and institution 10 is the largest. Eighty-eight faculty have nothing posted on the web, and one third (47 of 144) of faculty have a web site of some sort.

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Table 1
Number and Percent of Faculty with Web Sites (n=144)

Institution	Number of Education Faculty	Number of faculty with a web site	Percent with a web site
1	22	1	.04
2	21	5	.24
3	17	3	.24
4	9	0	0
5	13	2	.15
6	11	8	.73
7	14	0	0
8	7	5	.71
9	22	21	.95
10	8	2	.25
Total	144	47	Average .33

The number of Education faculty at the ten institutions range from 7 to 22 with an average number of 14 per institution. A correlation was not found between the number of Education faculty at an institution and the number of faculty web sites. The three institutions with the smallest number of faculty average 32% of faculty with web sites; the middle three in size average 27%; and at the three institutions with the most faculty members, an average of 41% posted a web site. One institution has only directory listings for faculty (#4) while another (#7) lacks both directory listings and faculty web sites. At the other end of the spectrum is institution #9, at which 21/22 or 95% of Education faculty have a web site.

Table 2 looks at different faculty ranks to determine if any particular rank posts web sites more than others. The researcher wanted to determine if faculty leaders, such as department chairs, post web sites to a greater extent than other faculty. For each rank, the number at the rank (# at rank) is listed as well as the number of those at that rank who have a web site (# WS).

Table 2
Difference between Ranks in Number of Web Sites (WS)

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	Department Head or Chairperson		Dean or Associate Dean		Assistant Professor		Associate Professor		Full Professor		Rank unknown	
	# at rank	# WS	# at rank	# WS	# at rank	# WS	# at rank	# WS	# at rank	# WS	# at rank	# WS
1	1	0	1	0	3	0	2	0	9	1	6	0
2			1	1	13	3	6	1	1	1		
3					4	0	4	0	9	3		
4	1	0			6	0	2	0	0	0		
5	1	1			3	0	4	1	1	0	4	0
6			1	1	7	4	2	2	1	1		
7					1	0	8	0	5	0		
8					3	1	2	2	2	2		
9	1	1			8	8	5	4	8	8		
10					2	0	2	1	4	1		
Totals	4	2	3	2	50	16	37	11	40	17	10	0
Percent	.50		.66		.32		.30		.44		0	

There was little difference found between the percent of tenured and untenured faculty posting web sites, though a higher percentage of full professors have web sites (44%) as compared to associate (30%) and assistant (32%) professors. Administrative faculty members have the highest percentage of web sites with 58% posting web sites. It appears administrative faculty do set an example for other faculty in terms of posting a web site; however, they do not tend to have the most up-to date sites. Of the 4 administrative faculty web sites, one site was last updated in 2005, one in 2001 and the other two looked very dated, although an exact date could not be determined. Due to the small number of administrators identified (seven), these findings may or may not apply to a larger population.

Table 3 looks at the type of web site posted by faculty. The classification types used for this research include the Web Site (WS), either template based or of original design; an Enhanced Directory (ED) site on which faculty has added personalized information to a standard template; or a Directory site created by someone other than the faculty. These latter consisted of

basic location information and were not counted with faculty web sites. The last category is the Course Web Site, designed to support a course and containing minimal faculty information.

Table 3
Types of Faculty Web Sites

Institution	Number with any type of web site	Directory listings	Course Web Site	Faculty Web Sites (WS)	Enhanced Directory (ED)
1	1		1		
2	5			5	
3	3			2	1
4	0	9			
5	2		2		
6	8		1	7	
7	0				
8	5		1	1	3
9	21			1	20
10	2		1	1	
Total	47	9	6	17	24

Half (24) of the 47 faculty web sites can be categorized as Enhanced Directory sites, or faculty personalized templates. While some web sites use a template, the difference between the WS and the ED sites is that the web sites are usually multi-page sites with links from the home page to other pages. The ED sites are generally only one page and organized like a CV with a space for teaching, research, service, courses taught and professional background. Some are only two paragraphs while others are quite lengthy although all the information is on one page (no links to other pages).

Seventeen web sites are faculty designed, many showing evidence of planning, attention and multi-purposes. Some are strikingly original, combine personal and professional elements, and are up-to-date. Six web sites are Course Web Sites created primarily by faculty to support a course or courses. Some of these involve a tremendous amount of labor, with detailed

assignment, grading, syllabi and other information for as many as six classes, and some are primarily collections of links to resources for students.

These figures do not reveal the quality of the web sites. When the currency of each site is examined, a more accurate picture illustrating Education faculty web sites can be drawn.

Table 4
Most Recent Update of Faculty Web Sites

Institution	# of web sites	2008	2007	2006	2003-2005	2000-2002	Earlier than 2000	No dates listed
1	1							1
2	5	2	1			1		1
3	3		1		1			1
4	0							
5	2	1						1
6	8	2	1	3	1		1	
7	0							
8	5	1			1			3
9	21		8	2	1	1	6	3
10	2	1			1			
Total	47	7	11	5	5	2	7	10
Percentage		.15	.23	.11	.11	.04	.15	.21

Over a third of faculty (38%) have dates on their web sites from 2007 or 2008. On the other end of the spectrum are 7 faculty sites that have not been updated for at least 8 years. One site had 1994 as the latest date, and several appeared to have been last updated in 1997. A sizeable percentage (21%) of faculty sites, most often the ED sites, do not include dates, and the information on the web page is general enough so that users cannot tell when it was last updated.

Another consideration in examining faculty web sites involves content. A one-paragraph web page is not the same as a carefully maintained multi-page site rich in information. The websites were explored to determine what is included on faculty web sites. The elements were

identified by previous research listing those that should be present on faculty web sites. (Heiberger & Vick, 2002; Lennex, 2007; Palmiter & Renjilian, 2003).

Table 5
Elements found on Faculty Web Sites (n=47)

Institution	1	2	3	4	5	6	7	8	9	10	Total	%
Email	0	5	2	0	2	8	0	5	1	2	25	.53
Courses Taught	0	2	1	0	1	1	0	1	15	2	23	.49
Office hours	0	2	3	0	0	0	0	1	1	0	7	.15
Course Syllabi	1	2	0	0	0	3	0	0	0	2	7	.15
Office Phone	1	3	2	0	2	8	0	1	1	2	19	.40
Office location	0	4	3	0	0	6	0	5	1	2	21	.45
Photograph	0	2	3	0	2	8	0	5	21	1	42	.89
Professional experience	0	2	0	0	0	7	0	3	21	2	35	.75
Educational background	0	4	0	0	1	6	0	4	21	2	38	.80
Publications	0	2	2	0	0	5	0	0	16	2	27	.57
Research interests	0	4	2	0	0	5	0	1	14	2	28	.60
Professional memberships	0	0	0	0	0	5	0	0	3	2	10	.21
Links within institution	0	3	0	0	1	1	0	0	1	1	7	.15
Links outside institution	0	1	0	0	0	2	0	0	1	2	6	.13
Other phone	0	0	0	0	0	0	0	0	0	0	0	0
Advising information	0	0	0	0	0	0	0	0	0	0	0	0
Area Resources	0	0	0	0	0	0	0	0	0	0	0	0
Feedback Form	0	0	0	0	0	0	0	0	0	0	0	0

Lennex (2007) and Palmiter & Renjilian (2003) surveyed students and faculty to identify information that should be included on a faculty web site, and agree an email link, office hours and course syllabi should be present. Additional elements both students and faculty list as essential include an office phone number and a list of courses offered (Palmiter & Renjilian, 2003). Most faculty (53%) include their email address on their web site, and 40% list their office phone number. Almost half of faculty web sites include the courses the faculty member teaches (49%). Office hours and syllabi are included on only 15% of faculty web sites.

A particular strength of most of the faculty web sites is the inclusion of professional information about the faculty member. Items such as professional experience, Educational

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background, publications, and research interests are included by the majority of faculty. Professional memberships are listed by 21% of faculty. Most faculty sites do not include links to sites within or outside the institution, and no faculty web sites include User Feedback forms or other phone numbers (such as home or cell numbers).

Four purposes of faculty web sites were identified through the literature; 1) use as a course site or virtual office, 2) to share beliefs about teaching, 3) to share personal information, and as 4) a resource for students (Kreis, 1998; Lennex, 2007; Moor & Zazkis, 2000; Wang, 2007). The research does not distinguish between varying purposes or types of web sites, but prescribes the same elements for all faculty sites. In an effort to evaluate the content, and clarify the purposes of faculty web sites, the presence or absence of elements are examined based on the type of site each element would be expected to support.

A faculty web site may be used as a course site or a supplement to a course. Elements on the site should be courses taught, links to subject area resources, and syllabi. About 15% of the web sites include course syllabi. 13% of the sites contain links to sites outside the institution, mostly to professional organizations, and field resources. Only one web site lists a large number of subject area links and seems designed for the purpose of providing links to course related materials. Close examination shows six faculty websites were designed to be used as course sites, containing one or more course syllabi, links to resources, and assignments. However, these course web sites are often out of date; two were updated in 2007-2008, two support courses from 2004 or earlier, and two have no dates listed.

A web site may convey beliefs the faculty has about teaching and teaching experience. For faculty in Education, it may be particularly relevant to highlight P-12 experience. Elements

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on the web site that meet these purposes are professional background and beliefs about teaching. Only two faculty web sites include a teaching philosophy or statement of teaching beliefs, however, 75% of faculty include their professional background on their web site.

A web site may be designed for students to get to know the faculty member better through the sharing of personal details such as hobbies or family. Elements on the web site supporting this purpose are personal items about the faculty, such as hobbies, families and community activities, and a photograph. Only one faculty site seems designed primarily for the purpose of conveying faculty personality or non-professional interests, and only three additional faculty share personal details or interests on their faculty web site. The element supporting this purpose found the most frequently on web sites (89%), is a photograph of the faculty member.

A web site may be geared toward current students, and elements that should be found on the site would include faculty office hours, contact information, courses offered, course syllabi, links to the department (program information) and links to university resources. Current students may be considering taking a class and want to see the syllabus to get a feel for what the class is about. They may want to find out if a professor teaches a particular class. Students may need to know office hours and office location to pick up or drop off papers or meet with faculty. Links to university and department resources are helpful, as student may wonder if a course is required in their program, or want to register. Very few of the faculty web sites can be classified as student centered. Less than half the sites list office hours or phone number. Only about 15% include faculty's office location or course syllabi, and 15% have links to locations within the institution. No faculty web sites examined include academic advising information or a feedback form.

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Current and prospective students may want to know about the faculty member's background. Elements meeting this purpose include professional experience, educational background, research interests, and publications. Educational background was present the most often, with 80% of faculty posting this information. 75% of the sites include professional experience, and about 60% of the sites describe faculty's research interests and publications. The student survey by Lennex (2007) indicates graduate students are more interested in faculty professional information such as publications and research interests than undergraduate students. A faculty member teaching primarily graduate students may include different elements on the web site than one teaching undergraduate students.

Faculty web sites and the elements they contain vary according to the purpose of the site, and faculty may have different goals for their sites based on their needs, and the needs of their students and institutions. However, a very small minority of the faculty web sites examined contain general elements deemed optimal by previous researchers. Less than half the web pages contained four of the five recommended elements (office hours, syllabi, phone number, courses offered) and barely half list the faculty's email address. Regardless of the intended purpose of the site, faculty web sites, on average, did not include recommended elements. It does not appear as if most faculty pages are created for the purposes identified in the literature.

To better understand the purpose of faculty web sites, eight multi-page websites were examined in depth. These are the richest, most personalized sites of all those researched in the study, and should yield the most information about faculty's purpose for creating and maintaining a web site. While it is hard to generalize from such a small number of sites, it appears faculty who create multi-page websites do so to meet several purposes. The best web

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sites combine faculty's professional background, publications, research interests, links to subject or field resources, details about courses taught, contact information, and have been recently updated. Half the exemplary web sites share personal information about the faculty, and most are directed at students. Eight sites were considered exemplary and are showcased in Appendix A. Of the eight, three were from the same institution (Elon) and two others are from Keene. The other three were the only exemplary sites found at their respective institutions.

An examination of only the current web sites, those 18 updated in 2007-2008, should reveal faculty's current purposes in creating and maintaining web sites. Half (9) of the 18 are Curriculum Vitae type web sites, ranging from short career summaries to detailed CV's. Two more are designed primarily as support for courses, with brief CV's. The other eight are the multi-purpose exemplary sites described in Appendix A. Faculty who have recently created a web site, or have updated an existing site in 2007 or 2008, are primarily using their web site to showcase professional accomplishments, or for multiple purposes.

Discussion

The research questions ask "What percent of Education faculty at comparable institutions have web sites, and how up-to-date are these sites? What purposes do faculty web sites serve? What information is included on the sites? Do faculty administrators such as Chairpersons set an example by more often having sites posted than other faculty? Is there a correlation between faculty rank and having a web site?"

How many faculty have a web site?

A third (33%) of Education faculty at the institutions examined have some type of web site posted, with the percentage varying widely between campuses; from zero to 95%. The 33%

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figure is deceiving. Lennex (2007) initially reported a third of faculty had web sites, but when only the active sites which migrated to a new server were counted, the total dropped to around 13% of faculty. For this study, if only current web sites, and those with no dates are considered, then about 19% of Education faculty examined in this study have web sites. If only sites with dates of 2007 or 2008 are included, then 12% of Education faculty have up-to-date web sites. Thus, rather than 47, there are 18 current sites and 10 with no dates listed on the site, representing a minority of Education faculty with web pages. It can be concluded that over 80% of Education faculty at smaller Masters institutions do not create and maintain a faculty web page.

What is the purpose of faculty web sites?

Of the 47 websites examined, 17 of the sites are designed as professional sites detailing the accomplishments of the faculty member. These are often organized like a curriculum vitae, with areas for courses taught, research interests and publications, educational background, honors, and professional organization memberships. 11 of the sites are multi-purpose, combining a CV with course links, or personal information as well as subject area resources. 8 of the multi-purpose sites are described in Appendix A; the other three are outdated. 10 of the sites include brief, basic information such as rank, responsibilities, education, professional background, and research interests. These sites are mostly ED sites with templates for faculty to fill in. They are not as formal or detailed as the CV sites, and often consist of no more than a couple of narrative, biographical paragraphs. Six sites were designed to support one or more courses, one site is a business card site with just basic contact information, and one faculty web site contained nothing but the faculty's name and photograph. In summary, 36% of the 47 sites examined are electronic

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CV's, 23% serve multiple purposes, 21% include basic information about the faculty in narrative form, 15% were originally designed as course sites, and 4% are nearly empty.

The answers to the research questions are that few (12%- 19%) Education faculty at smaller Masters institutions have up-to-date web sites. The single most common purpose of faculty web sites is to serve as an electronic CV. About a fourth of the sites were designed to meet more than one purpose, such as providing information about courses to students, sharing personal information about the faculty, and sharing faculty research interests. No web pages examined contained a majority of the elements previous researchers have identified as optimal. While a greater percentage of administrative faculty posted web sites than other faculty ranks, the small number of administrative faculty web sites found does not allow for correlation between faculty rank and having a web site.

Rogers' diffusion of innovations theory posits that one characteristic of an innovation which influences adoption is "trialability", the extent to which the user can experiment with the technology and try it out before committing to it (Hansen & Salter, 2001). An innovation is more likely to be adopted if the user can try it out on a limited basis, but one cannot post a web page on a trial basis, as it is up on the web server or not. Web pages are highly visible, and the posting of one is a public act, and faculty may be reluctant to post a web page that is less than perfect. Rogers' theory identifies the innovations relative advantage over its predecessor as another characteristic linked to adoption (Hansen & Salter, 2001). There is not a clear predecessor to the faculty web page, as it does not replace previous ways of communication, or meet needs better than what was used before. A web page may act as a supplemental form of communication, but does not exhibit a clear relative advantage which would encourage faculty adoption. Rogers'

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diffusion theory also identifies ease of use of an innovation as a key factor in the level of adoption (Hansen & Salter, 2001). At some institutions, the lack of "ease of use" has been a deterrent to faculty trying to post and maintain web pages, especially for faculty who created their web page years ago, before the advent of user-friendly software.

Application of The CBAM model indicates most faculty (67% or more) are at the non-use level when it comes to web pages. A few faculty are in the utilization stage of adoption, using their web page for a specific purpose; generally as an electronic curriculum vitae. Fewer still have moved into the integration stage and are creating and maintaining a complex website which meets multiple purposes, and is integrated into faculty research, teaching, and other aspects of faculty life.

The Learning/Adoption Trajectory model explains the large number of faculty with a page created many years ago; they tried the technology and decided to reject it for professional use. The adoption models suggest the reason some teachers do not use technology is lack of motivation, not lack of expertise, training, or any of the usual barriers; "Some teachers who have the training and the technology refuse to use it" (Zhao & Cziko, 2001, p. 8). Faculty may see a disconnect or conflict between goals such as excellent teaching, and the time it takes to create and maintain a website, and at the very least fail to see how a faculty webpage will help them better meet their professional goals. Through application of the PCT model, Zhao & Cziko (2001) argue we assume teachers do not use technology because they have not been trained, however, teachers may not want to receive training in technology because they see no reason to use it. For example, faculty may consider their teaching to be excellent without a website, and do not see how a website relates to or improves teaching.

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The results of this research raise the question; “Why do some professors use websites more than others?” Discussions with faculty at the researchers’ institution initially show barriers such as training, on-going support and software to be reasons faculty state for why they do not create or maintain websites. However, when these barriers are alleviated, faculty still do not adopt this technology. The reasons then given include time, motivation, and perceived lack of benefit. Faculty say they have too many other things to do, that seem more important. In addition, there is no pressure on faculty to update or create websites; the administrators usually have very outdated websites.

The eight exemplary faculty who created the websites highlighted in the Appendix were contacted, in person or by email. All their websites have been updated within the last year, and only two contain broken links; these faculty are updating and using their websites. The exemplary website faculty were asked about why they have such detailed, rich sites. The answers varied. One faculty said it was her professional home, that she worked on her site several times a week to reflect her career, teaching and interests. She said the website evolved over time, and was added onto gradually, and as she worked on it she would find new uses for the website. Another wrote about workshops for the education faculty once a month before the department meeting. Faculty were shown how to create a website at one of these workshops, and several have continued to maintain and add to their sites. This well scheduled faculty training helps explain why the institution under discussion, Elon, has three of the eight members whose websites were identified as exemplary. One faculty believes the reason many faculty do not keep their website up-to-date is that faculty do not regularly schedule time to keep the website up to date, so that after the initial excitement wears off, the website falls into disuse. Several of the

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faculty said they had a purpose in mind for the site when they created it, but it has evolved beyond that singular purpose (see Appendix A). Some of the reasons for creating the site originally include letting students get to know the faculty member, modeling technology use for students, a place for research for students, and a place to post links and resources for students. Two of the faculty mentioned that they were not updating their site as often as they thought they should be.

Strategies for faculty web pages

Just as IT support varies by Carnegie classification (Hawkins and Rudy, 2006), campus, faculty and student needs vary by institution and by entities within each institution. Each department or unit must determine its needs for faculty web sites. If deemed necessary, the faculty, departmental and institutional purposes of faculty web sites should be agreed upon and clarified, and realistic plans formulated for how they will be created and maintained. Strategies for faculty web sites include the following:

1. Create and implement an easy-to-use directory type template for faculty use.
2. Encourage traditional web sites, reduce barriers (training, software, time), and focus on the benefits to faculty.
3. Allow web sites to die a natural death as CMS, blogs and other technologies move to the forefront.

Strategy 1. One solution is a directory-type template (described in this study as an Enhanced Directory type web page) originating from the department, and giving users basic contact information for each faculty member. This provides all faculty with an electronic presence, and the template can be personalized by each faculty member, including a link to a more detailed

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web site if desired. Fayetteville State University has chosen this solution and an impressive 95% of Education faculty have a web presence (http://www.uncfsu.edu/mgss/staff.htm).

If faculty web sites are considered a marketing tool for an institution, perhaps by attracting prospective students, then a template offers a more professional solution than some of the design features found on faculty pages, such as unprofessional backgrounds, animated gifs and photographs which take minutes to load. A short template based faculty web page makes it easy for students to locate information, such as prospective graduate students interested in faculty research. The template page can contain only general information about faculty, with no dates listed, and it will not be obvious if faculty do not update their web page.

Keene State College has created what they call a directory profile for faculty, which can be updated by copying and pasting text inside boxes. The college posts the following instructions which make it very easy for faculty to create and edit their directory site:

> Managing Your KSC Directory Profile
>
> Your KSC directory profile information appears when people search the KSC's online directory (www.keene.edu/directories) or when they click from the discipline faculty sites like the Art Faculty site (www.keene.edu/catalog/faculty.cfm?DiscId=1.)
>
> By default your profile contains your campus address, e-mail address, campus phone number, title, and department. You may add a few paragraphs of biographical information, a link to your professional home site, an alternate e-mail address, and/or your headshot. To see an example, visit Nona Fienberg's directory profile at www.keene.edu/directories/facstaff_detail.cfm?EmployeeId=256.
>
> How to update your directory profile

a. Go to www.keene.edu/forms/MyProfile.cfm.

b. Click “Edit my Employee Profile”

c. Under Personal/Professional Profile: a. type in the URL to your professional home site and/or b. copy and paste a few paragraphs of biographical information in to the “Bio” textbox.

Click Submit. (academics.keene.edu/lfarina/documents/KSCDirectoryProfile-Howto.pdf).

Strategy 2. An institution may choose to continue hosting traditional faculty web sites, but may need to make some changes if only a small percent of faculty have updated web sites, especially if outdated pages reflect negatively on the institution or department. The barriers of lack of time, training, and resources such as software, need to be addressed to increase the percentage of faculty creating and maintaining web sites (Bauer & Kenton, 2005; Brzycki & Dudt, 2005; Henry, 2002; Weaver, 2006). Additional key elements include administrative leadership and focusing on the benefits of web pages for faculty (Wepner, Scott, & Haysbert, 2003; Spotts, 1999; Zhao & Cziko, 2001).

Conflicts between faculty professional goals (such as multiple demands on faculty time) can be lessened by providing on-site support, release time, and easy–to-use tools (Zhao & Cziko, 2001). Bee (2000) compared the faculty who created and used an academic web site to those who did not. Non-users did not believe they had the time to maintain a web page, even if one were provided for them, and felt the time spent maintaining it could be better spent in other activities. Non-users may not see the faculty web page as of direct benefit to students, and users may not receive feedback from those who use it, and thus fail to maintain their faculty web page

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(Bee, 2000). Models of technology adoption advocate convincing users that there is a real need to use technology, either to improve teaching or because it is required to keep their job (Zhao & Cziko, 2001).

Much has been written about how to support and encourage faculty use of technology (Bee, 2000; Harley, 2007; Spotts, 1999; Stern, 2000). "One reason web sites fail is that too often they are the initial effort of a new web author. Without support for continued revision and authoring, the site stagnates while technology advances, links go dead and content becomes outdated" (Stern, 2000, p. 11). Since the development of easy-to-use web editing software, such as Contribute, the challenge may lie not in creating the site, but providing ongoing support for faculty to revise the initial site.

The web site must benefit faculty, by helping them meet their professional goals more efficiently or in unique ways. A web site that is a marketing tool for the professor might highlight research so as to attract potential collaborators, or focus on areas of faculty expertise for local school districts needing professional development. Faculty who may be on the job market might be motivated to develop an electronic curriculum vitae. Faculty must perceive the value of a web site to put forth the time and effort to create and maintain one (Spotts, 1999).

Harley (2007) discusses the results of a survey completed by over 800 higher education faculty.

> 'the lack of faculty willingness to change' is often cited as a key barrier to wider adoption of a variety of technologies in undergraduate teaching and other forms of scholarship. Our experience with faculty needs and attitudes raises the question, do many 'producers' of technological tools and systems pay much attention to the unconvinced, indifferent,

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> tired, frustrated, or thwarted academic "consumers'? Or do they simply dismiss many non-adopters as aberrations, luddites, or dinosaurs, with little reflection about the complex reasons why many scholars have not yet embraced the promise of the 'new, new' technological thing? (p. 12).

Harley encourages IT people to have dialogues with the full range of faculty they wish to serve, not just technology enthusiasts, in order to truly identify and address the barriers faculty face in creating and maintaining web sites. Ertmer (1999) described two levels of barriers to teacher's integration of technology. The first order barriers are extrinsic, including lack of time, software and support, while the second order barriers are intrinsic and include belief systems about teaching and learning (p. 94). Both levels need to be addressed for successful and sustained used of technology, such as faculty web pages.

Strategy 3. Allow web sites to die a natural death as other technologies move to the forefront. Technologies such as blogs, social networking sites and course management systems may be the technology tools replacing web sites. A survey by Thompson Learning indicates 10% of faculty have their own blog (More faculty, 2007). School of the Art Institute of Chicago offers links to faculty blogs much as other institutions offer links to web sites (http://www.saic.edu/admissions/blogs/index.html).

Hawkins and Rudy (2006) report that course management systems are used at 97% of Masters level institutions, and 100% of faculty use a CMS if one is deployed by their university; either selectively (72.2%) or for nearly all courses (27.8%). CMS are not just used for online courses; they are used three times more often to create a site for an existing course than to host

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an online course (Malikowski, Thompson & Theis, 2007). 90% of the courses taught at the University of Virginia use their version of a CMS (Ayers, 2003). The latest "Current Issues Survey Report" lists CMS among the top ten issues facing higher education CIO's (Camp, DeBois & Educause Current Issues Committee, 2007). The authors attribute this visibility to "its accelerating use as a critical teaching and learning resource by institutions of all kinds" (p. 29). A CMS replaces a course web site designed by faculty, providing more sophisticated tools and support and allows students to get to know faculty, through the discussion forums and posting of faculty information. A CMS integrates technology with teaching, and research suggests that linking technology to teaching results in a higher level of technology integration (Mazden & Edmunds, 2007; Vanetta,& Beyerbach, 2000; Wepner, Scott, & Haysbert, 2003). It is likely the low adoption rate of faculty web pages is due in part to lack of a clear link to teaching, a characteristic some newer technologies do not share.

This third solution is the easiest to implement, as one simply does nothing. Technology innovations have a cycle of use (Brzycki & Dudt, 2005), and it could well be the faculty web site is on its way to obsolescence, to be replaced by newer, more interactive technologies**.** The minority of faculty who wish to develop web sites will continue to do so. Other faculty will find blogs, or interactive social networking sites more to their liking or purposes. As CMS become ubiquitous, faculty may use the internal web site tool, the discussion forums, built in wiki and blog tools, or simply post their CV in the electronic classroom as a replacement for a faculty web site. A combination of tools may best meet faculty and student needs, and may already be replacing the use of faculty web pages.

Limitations and need for further research

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This study examined Education faculty websites in 10 Masters level institutions with enrollments between 4700 and 5700. The results may have been different for community colleges or Research 1 institutions, or for departments or schools other than Education. A month or a year from now, all 10 institutions may have implemented one of the solutions described or an entirely different one, as technology changes so quickly. Results can only be generalized to this group of institutions at this time.

Further research might examine other types of institutions or subject areas. Examination of Computer Science faculty web pages might provide very different results, as would faculty web pages at a larger institution. An additional avenue of research concerns P-12 teachers and their use of web pages. One recent study did not find a link between faculty attitudes toward technology and teachers use of classroom technology (Bai & Ertmer, 2008). However, the lack of modeling and promotion of faculty web pages by Education faculty may influence students' future use of web pages. Research should also examine if web page design is an important or obsolete skill for P-12 teachers.

The CBAM model identifies a category of non-users with any technology adoption. As there are so many non-users (faculty who do not have a website at all and have apparently never created one), more research into the reasons of non-adoption is needed. Website development is a mature technology, making it possible to research issues of adoption over a decade or more.

Conclusion

Faculty web sites can offer benefits to the institution, the faculty, and prospective and current students (Stern, 2000). Certainly today's students are prolific users of the web, and students find information posted on faculty web sites helpful (Lennex, 2007; Palmiter &

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Renjilian, 2003). Benefits to faculty include providing a professional site for contacts such as research or consulting inquiries, and for building rapport with students. These benefits have existed for many years, yet most faculty do not create and maintain a professional web site. 97 of the 144 education faculty (67%) examined do not have any type of professional web site posted on their department website, or linked from the institution. Faculty websites are a technology most faculty have not adopted.

Faculty may feel guilty if they aren't using technology the way they "should" be, yet are often faced with multiple barriers and little incentive to adopt new technologies. Too often technology drives a wedge between those who think faculty should be using more technology or using it differently, and the faculty members themselves.

Faculty and those who support faculty need to continually monitor how technology is helping to meet professional goals. One answer does not fit all, as each department and institution is unique, and the answer for each will vary. Thoughtful discussion between stakeholders needs to take place, and the purposes of faculty technology use clearly defined. Finally, institutions must be willing to abandon or modify technology solutions that are counter-productive, working for only a minority of users, or have reached the obsolescence phase of the technology innovation cycle, as well as commit to exploring new technologies that better meet faculty needs.

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Appendix A

Exemplary Faculty Multi-purpose Web Sites

Faculty And Rank	Personal info. included	Course info. included	Research interests, Public-ations	Links to resources in field	Purposes of web sites
Dr. Bryd (http://facstaff.elon.edu/sbyrd2) Assistant Professor	No	Yes	Yes	Yes	"The purpose of this website is to provide you with helpful resources and links related to special education both locally and internationally" Research shared; link to CV.
Dr.Taylor (http://facstaff.elon.edu/btaylor/) Associate Professor	Yes	Yes	Yes	yes	"Through the text below and the links above, I hope you can learn more about the roles I fill in my professional and personal life". Current syllabus. Current office hours.
Dr. Tomasek (http://facstaff.elon.edu/ttomasek/) Assistant Professor	Yes	Yes	Yes	Yes	"The purpose of this website is to highlight aspects of my professional life". Personal information shared.
Dr. Lory (http://academics.keene.edu/nlory/) Full Professor	No	Yes	Yes	Yes	Student centered. Description of research, background. Links to organizations, special education resources.
Dr.Nuffer (http://ac	No	Yes	Yes	Yes	Professional website; teaching, research, service.

ademics.keene.edu/enuffer/index.htm) Full Professor					Course support, teaching beliefs.
Dr. Longfield (http://www.iun.edu/~edujal/) Assistant Professor	Yes	Yes	Yes	No	CV, Lot of personal information, class site. Includes Teaching philosophy.
Dr. Kassem http://phobos.ramapo.edu/~ckassem/frame.html Full Professor	No	Yes	Yes	Yes	CV, course support, links to publications.
Dr. Johnson http://faculty.uncfsu.edu/jjohnson/index.htm Full Professor	Yes	Yes	No	Yes	Course support; Many field resources. CV, research interests

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The Fall and Rise of Information Appliances

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"in the late age of print, we see the move to heterogeneity and hybrid form, including on-demand printing from digital databases, printed books and magazines that refer to Web sites, Web sites that preview and sell books, and so-called 'information appliances' that combine the characteristics of books, notebooks, and calendars."

-- J. David Bolter

Abstract

This article examines the relationship between information appliances and the potential impact they could have on computer-mediated learning. The first section provides a stipulative definition of the term information appliance, and examines old, current, and emerging technologies to see how they may or may not fit with this definition. This is followed by a section covering the historical groundwork of first generation information appliances. It focuses on how they initially came into being, followed by a contextual framework explaining why virtually all of these early devices failed and why newer ones may succeed. The final section forecasts additional uses for these devices in computer-mediated learning environments in Bolter's late age of print, as viable tools to promote technology literacy.

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What is an Information Appliance?

What are "information appliances"? Are they the same as "Internet appliances", or perhaps Internet / email kiosks of some sort? Are information appliances stationary or portable? Are they personal digital assistants (PDAs) such as the Palm line of Treo products, or similar offering from HP, Motorola, and Blackberry? Are Internet appliances similar to the failed SONY Clie, dubbed as a "Personal Entertainment Device", or an iPod or iPhone? The answer to all these questions is yes. And no. Information appliances do not necessarily share the same form factors or feature sets, nor do they share the same operating system, connectivity, nor are they exclusively stationary or exclusively portable, necessarily wired or necessarily wireless. One characteristic they do share, however, is that in one form or another, information appliances likely represent the future of computer-mediated learning.

The TechEncyclopedia defines information appliance synonymously with Internet appliance, as "a device specialized for accessing the Web and/or e-mail, designed for ease of use". This somewhat vague definition is then qualified by the disclaimer that "The term is rather encompassing, and innovative products are expected all the time." (TechWeb, 2007) For the purposes of this text, I will stipulate my own definition: information appliances are multipurpose electronic devices, relatively compact, and connected. This is a notion similar to that of Vannevar Bush's detailed in *As We May Think*: a Memex-style, interactive device capable of sending and receiving information from a number of different sources. Bush, one of the primary architects of what we now know as hypertext, describes the Memex as:

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> a device in which an individual stores his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory (Bush 1996, 32)

Admittedly, Bush's Memex was no less than desk-sized, so the similarities between the Memex and my own views of what features and functions comprise an information appliance perhaps end there. However, keeping in mind Bush wrote *As We May Think* in 1945, the monolithic form factor of the Memex is not entirely unexpected (in later works such as *Memex II*, the physical footprint of the Memex did appear to shrink somewhat, as well).

To me, for a device to be considered an information appliance, it must be able to do more than one specific task, such as store contact information or access email. If they only do one task, then that task necessarily defines what they are. For example, the Apple iPod shuffle plays digital audio files. That is all it does, thus it is a digital audio player or more generically an MP3 player, and not an information appliance. I realize it may also play digital audio files in other formats, as well, but the term "MP3 player" seems to have caught on from a marketing perspective, and is certainly easier to say and remember than "digital audio player".

Information appliances must also be somewhat portable, as well. I say this primarily because a lack of portability, to me, conjures up images of heavy, monolithic desktop computers, primarily designed with stationary access in mind. I suppose desktop computers are information appliances in the broadest possible sense, in that they are not limited to one task (such as, say, word processing), they are at least *luggable*, and they typically are connected. However, portability somehow seems more important now, particularly in our gadget-driven culture. In terms of computers, portability is steadily becoming a key factor. The desktop computer market

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has slowed to little more than a crawl over the past three years, while laptop sales have increased. In fact, according to technology industry analysts such as Gartner and IDC, laptop sales are steadily taking away marketshare from their desktop counterparts. (Kanellos 2003)

Aside from portability, this rise in portable computers has also been attributed to the popularity of wireless networking and broadband. (Smith, 2003) As such, am I further defining "portable" to mean less than three pounds, or less than 10 ounces? No, I am not. If it can be toted around fairly easily and in a reasonably convenient manner, for the purposes of this project I consider it "portable". [I should point out, however, that many new laptop computers just barely fit that category now. Some weigh-in at close to 10 pounds, which is hardly convenient and only moderately portable.]

Finally, information appliance must be "connected". I selected this term for intentional vagueness, as I do not necessarily mean to equate "connected" with "Internet-connected". In this case, such a device might only need to be connected to an intranet, or LAN, in order to send and receive information. It really depends on the context of how such a devices is being used, of course. Additionally, the term "connected" might also just refer to a high-speed serial connection of some sort, such as USB or FireWire, or could refer to a wireless connection method, such a 802.11b/g or BlueTooth. As long as the device is not a technological island, it can be considered "connected". As such, my definition of the term is perhaps more broad and open-ended than that of the TechEncylopedia, and really becomes more of an umbrella-like term that can refer to any number of seemingly different devices.

Why Early Information Appliances Failed

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The initial round of information appliances included much-hyped devices from experienced, well-financed companies such as 3com, SONY, and Compaq. These were integrated monitor / cpu devices, such as 3com's Audrey, that featured email and PDA-like capability, and were typically advertised as being household appliances no different than any other household gadget typically found in a kitchen or den. Along with these established players within the IT industry came several startups, such as Cidco and Larry's Ellison's New Internet Computer. While the companies themselves may not have had much in common in terms of their size, age, or technological footprint in home and education markets, their products all espoused a similar ideal: access, quick and convenient.

Yet, in spite of the collective marketing force of these companies, and in spite of the promise of easy access to information and a generally low learning curve, virtually none of these devices survived. Why did this initial crop of information appliances fail? Will emerging information appliances be any more successful? These questions about early information appliances did not go unnoticed within our discipline, but even then this attention largely focused on the potentially adverse effect these devices might have on literacy. It was the I-Opener, for example, that served as a catalyst for Gail Hawisher's remarks in *Accessing the Virtual Worlds of Cyberspace*. In reference to the I-Opener, Hawisher remarked:

> multi- and transnational corporations will make sure that they target this market and other large segments of the world's population for profit. Vast numbers will be able to browse the electronic world and make purchases, but will they be able to participate easily in the kinds of personally and educationally profitable activities of which we--the connected

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and educated of the world--now partake? These are the sorts of questions that trouble me (Hawisher, 2000).

Regarding the I-Opener, Hawisher certainly had a valid point. The concerns that troubled her about this device were not isolated. Not only was the I-Opener only capable of Internet access via Netpliance Internet access, but the device itself sported keyboard buttons used to exclusively promote commercial partners with Netpliance, even going so far as to include a "pizza" keyboard button for quick access to the nearest pizza chains that have established a business relationship with Netpliance. (Regan online) The utterly crass commercialism associated with the I-Opener was not lost on consumers, and the product was subsequently discontinued less than two years after the initial launch.

While not specifically addressing the I-Opener, Mayers and Swafford argue essentially the same point as Hawisher. In The *Reading the Networks of Power: Rethinking "Critical Thinking" in Computerized Classrooms*, they assert that if the true literacy-based aspects of technology are to be realized "it is our responsibility to rethink the technology along the axes of its larger social, economic, and political implications" (Mayers & Swafford, 153). In the case of the I-Opener, these implications proved to be too much of a hurdle for it to be used as a viable classroom technology, and even for it to survive as a viable information appliance.

The I-Opener was not the first information appliance to vanish almost as quickly as it arrived, nor is it likely to be the last. In the case of the SONY eVilla, the product was shelved before it was even publicly launched. While certain individual factors specific to these companies may have contributed more or less to the demise of their respective products, such as the "dot com" bubble bursting shortly after many of these products were initially heralded,

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causing a widespread vacuum in venture capital need for further research and development, the primary reasons were twofold:

- Many of these devices, such as the SONY eVilla and Compaq iPaq IA, cost nearly the same amount as a typical desktop computer, but provided significantly less functionality than one. Had the eVilla been launched as planned, it would have cost roughly $500, yet it was barely upgradeable it terms of processing power, memory, or connectivity. Since it relied on a conventional 15 inch CRT monitor for the primary display, the eVilla also took-up roughly the same footprint as a typical consumer-level desktop computer would. As such, why not instead buy a regular computer?
- Most of these early information appliances were essentially "sealed boxes" running proprietary software, capable of only connecting to specific Internet service providers (ISPs), rather than any ISPs. As the case with the Netpliance I-Opener exemplifies, it made little sense from a consumer perspective -- and absolutely no sense from an institutional perspective -- to purchase proprietary systems that could only connect to commercially affiliated service providers.

These flaws ultimately proved fatal for the vast majority of early information appliances. The majority of them proved to be little more than "false pretenders" on the path toward memex-like hybridization. In his groundbreaking text on electronic books, *The Future of Libraries*, Kurzweil defined the seven stages in the lifecycle of a technology. He asserted that false pretender technologies are as follows: "Here an upstart threatens to eclipse the older technology. Its enthusiasts prematurely predict victory. While providing some distinct benefits, the newer technology is found on reflection to be missing some key element of functionality or quality."

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(Kurzweil, 1992) Donald Norman echoes this sentiment about early IAs, as well, in *The Invisible Computer: Why Good Products Can Fail, the Personal Computer is So Complex, and Information Appliances Are the Solution.* Norman asserts that these early devices were largely "underpowered and overpriced, incapable of producing the results required by the consumer" and that they often duplicated functions available from existing technologies. (Norman 237) Ray Rischpater draws essentially the same conclusions. In his influential text *Internet Appliances,* he points out that:

> Few if any of these products remain today except in vestigial form in today's IAs. In many cases, the companies behind these products have changed direction or disappeared entirely. ...In other cases, more successful companies abandoned their efforts, or changed them so completely that the original products can no longer be clearly identified. (Rischpater 8).

The two notable exceptions were the New Internet Computer (NIC) and the Mailstation. These two survived slightly longer for different reasons, but their survival was ultimately short-lived. One of these devices probably had some potential as a tool for computer-mediated learning, while the other did not.

Why Some Newer Information Appliances May Succeed

The Mailstation, eventually purchased by Earthlink and briefly sold as the Mivo before being discontinued, never targeted an education institution demographic, likely due to its limited feature set. The device was roughly the size of a computer keyboard, having essentially the same footprint as the AlphaSmart Pro devices, and offered basic email and personal information manager functionality. Newer versions also sported a calculator and text-based Yahoo News

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articles which were auto-updated throughout the day. Those features represented the limits of the Mivo / Mailstation -- particularly given the small LCD display integrated into the unit. Earthlink attempted to offer this device essentially free after mail-in rebate, in exchange for a 1-2 year service agreement with a $10 - $12 monthly fee. As a low-end information appliance targeting a niche audience, this device perhaps met a need. As a tool for advancing technology literacy, it was not significant.

The New Internet Computer, commonly abbreviated as the NIC, was another matter. From a hardware perspective, it had essentially remained unchanged since it was first developed, right up until it and the NIC company itself were scrapped. This device could, at the time, "get away" without making drastic hardware changes primarily because the functions it performed, including web-surfing, instant messaging, email, newsgroups, etc., were not CPU-intensive. In fact, they were dependent more on bandwidth than processing power. Thus, even though the NIC used an obsolete processor, the fact that it also included an ethernet port compensated (assuming the environment where the NIC was to be used had such connectivity methods). The NIC was unique -- and to an extent still is -- due to it relying entirely on open hardware standards and open source software. In fact, when it was "updated" it was typically done so via a new software CD only.

Keep in mind, however, that these are just two devices from a previously dense field of several others. The fact that these two briefly survived at all, speaks little to these specific products and more to the failure of information appliances in general. Simply put, since the vast majority of these devices were overpriced, underpowered, and tended to go with proprietary

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solutions for much of their connectivity and/or functionality, most of them were fatally flawed from the start.

A somewhat similar example was made by Linspire, a company specializing in user-friendly Linux systems from serial entrepreneur Michael Robertson. At one point, Robertson hyped his Lindows Media Computer (the company name, at the time, was "Lindows" but was later changed to "Linspire" as part of an out-of-court negotiation with Microsoft). The device was billed as a "low-cost multipurpose computer" cost under $300, not including a monitor (Lindows.com 2003). The Lindows Media Computer offered television connectivity and other functions, including web browsing, email, chat, digital audio and video playback, and a full range of word processing and presentation options (via the included OpenOffice.org suite of programs).

While this device also came and went with relatively little attention, I believe it marked the beginning of a trend for Internet appliances: The Lindows / Linspire Media Computer offered a low price point, small form factor, and standard connectivity solutions (meaning it can use any ISP via a regular ethernet connection). It relied almost exclusively on open source software, and nonproprietary file formats. This meant that there was technically no way it could be "locked" down to only function with commercially-partnered services or overly-restrictive digital rights management (DRM) technologies, nor did it need to rely on annual contracts and licensing fees associated with proprietary files formats. OpenOffice, for example, uses open standard extensible markup language (XML) file formats for its word processing, presentation, and spreadsheet applications. This means they can be opened and accessed from a variety of competing programs, with virtually no data loss or corruption, or formatting issues.

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Additionally, these device used and relied on other standard formats for accessing audio, video, and text-based files, including Flash, PDF, Ogg Vorbis, MPEG 1 and 2, and HTML.

In short, Linspire and NIC created information appliances that had the potential to be flexible, easy-to-use classroom technologies that could have allowed our students to perform the vast majority of tasks they need to in order to technologically succeed in an academic environment. Creating such an ideal classroom technology in order to bridge the digital divide was actually a stated goal of both companies. NIC, for example, stressed their dedication to "up-leveling the quality and productivity of people's lives by providing the most simple, reliable and affordable computers for use in educational organization". (ThinkNIC.com, 2004)

Given the low price point and generally open-ended functionality of the NIC and Lindows / Linspire Media Center, I suspect later iterations of these or similar information appliances may eventually incorporate digital video technology and be near-ideal classroom solutions. Of course, Linspire is not alone in this pursuit. As PDAs and smartphones become more commonplace at home, at work, and in the classroom, and as these devices gain additional functionality and expansion capabilities by way of add-on peripheral connection cards, their collective potential for becoming viable classroom technologies increases. Many newer devices, such as Palm's Treo or Centro line, Windows Mobile variants such as the Motorola Q or the Samsung Blackjack, or Apple's iPhone or iPod touch feature wireless networking capability combined with email, web browsing, instant messaging / short-text messaging service (SMS), in addition to the typical personal information manager features available in all PDAs. Add-on expansion cards (for all except the Apple devices) provide memory expansion, GPS options, wireless network connectivity, VGA video-out (for connection to a projector), and a host of

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possibilities previously unforeseen even a handful of years ago. To a lesser or greater extent, many students, faculty, and institutions are adapting these devices for use in computer-mediated learning environments.

Many of my own students, for example, routinely bring their PDAs or smartphones to class, along with compact, folding keyboards, to take lecture notes, access online content via the wireless network connection available in our building, and to transmit information and files back and forth as needed (which involves a different, older method of wirelessly transferring data than that used in the previously mentioned wireless network zone). They are using and adapting these information appliances every day, with seemingly little effort, without my prompting them to do so. At this point, there appears to be a great deal of synergy between what my students want these devices to accomplish in class, and what the devices themselves are capable of actually accomplishing.

Conclusion: An Information Appliance Future?

Exactly what the future holds for information appliances is unknown, of course. Apple Computer's Newton, for example, was perhaps one of the first information appliances mass-produced for the public, and in some regards may have been responsible for creating the entire PDA industry as we know it today. When the Newton first came out, it was literally in a class by itself--typical PDA offerings from Palm and other competitors did not even exist.

Yet, in spite of the utter lack of competition, and in spite of advanced functionality ideally suited for computer-mediated learning (including word processing, handwriting recognition, Internet / email connectivity, and a array of expansion options), sales of the Newton were poor and Apple subsequently discontinued it in 1997. Problems associated with the

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Newton, such as initially poor handwriting recognition, expensive upfront price, and a necessarily large form factor (due to available components at the time not yet being miniaturized enough) ultimately proved fatal for this innovative device. Simply put, it was ahead of its time, and existed in a market that had not yet established itself.

However, if the Newton did not survive in a field wholly devoid of competitors, why would newer information appliances survive in a field densely-packed with competitors? Examples would include smartphones, the iPod / iPhone / iTouch, Intel's Ultra Mobile Personal Computer (UMPC) platform, "netbooks" such as the MSI Wind and ASUS EeePC -- which has been described as being not so much a true laptop, but rather "an appliance" (Smith, 2007, para. 8) -- and even open source, subscription-based products like Zonbu. Even if these devices survive and even thrive, will they be suitable classroom technologies? Will they amount to helpful tool to further break down traditional access-related hurdles associated with more costly technologies?

Given the necessarily fluid and evolving nature inherent in most information technologies, it is difficult to forecast how any of these specific devices might survive as viable tools for computer-mediated learning. There are simply more questions than answers at this point, as this current generation of such devices are relatively new and untested in the classroom. Yet, these devices ultimately represent both an opportunity and a challenge if we are to consider using them as classroom tools. In this late age of print Bolter, Kurzweil, and others have forecasted for so long, efforts to critically examine the potential of emerging technologies, and somewhat less-than-obvious information appliances, should be applauded and encouraged.

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Reading Management Programs: A Review of the Research

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Abstract

This manuscript reviews research to date on the instructional use of reading management software programs. The manuscript provides an overview of these programs, including their history and diffusion; describes their theoretical basis; and examines research findings on reading management software in three key areas (program implementation, reading achievement, and student attitudes). High quality implementation at both the classroom and school level is critical to reading management programs' success. Additionally, careful attention should be given to the balance between extrinsic and intrinsic motivation. Parental involvement in reading may also play a pivotal role in the successful implementation of reading management programs. The authors conclude that more research is needed and especially longitudinal studies, to fully understand the impact of reading management programs.

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Literacy has important life consequences for people living in industrialized countries such as the United States. More specifically, low literacy levels put children at risk for problems later on as adults, including low socioeconomic status, poor quality of life associated with poverty, unemployment, welfare dependency, and teenage pregnancy (Berlin & Sum, 1988; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Kutner, Greenberg, & Baer, 2005). Focused national efforts to improve the teaching of reading in the U.S. have had disappointing results.

The overarching goal of the No Child Left Behind Act (2001) is to close the achievement gap, particularly among low-achieving children (e.g., poor, English language learners, migrant, and those who need reading assistance) and between minority/non-minority and advantaged/disadvantaged students. While the National Assessment of Educational Progress (NAEP) 2007 reading assessment of 4th grade children showed that the gaps between white and black or Hispanic children narrowed slightly since 2002, no significant change in 8th grade reading score gaps occurred between white and black or Hispanic students during the last 15 years (Lee, Grigg, & Donahue, 2007).

A variety of approaches to improve reading achievement have been introduced in schools, including several that deploy new technologies (see, e.g., Kulik, 2003). Among technology-based approached, reading tutorial packages have received a great deal of attention and scrutiny, with a recent national study suggesting they fail to have any positive effect (Dynarski et al., 2007). However, less national attention has been paid to *reading management programs*, which use software to encourage, direct, and assess students' independent reading from books, and are among the most widely used educational software programs in the country.

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In this paper, we review research to date on the instructional use of reading management software programs. We begin with an overview of these programs; describe their theoretical basis; examine research findings on reading management software in three key areas (program implementation, reading achievement, and student attitudes); and then discuss the implications of this review for educational practice and further research.

The History and Diffusion of Reading Management Programs

The first reading management program, The Electronic Bookshelf, was invented in 1981 by a school librarian who wished promote reading in children and hold them accountable for that reading (Everhart, 1998). Electronic Bookshelf software included a recommended book list, multiple-choice comprehension quizzes, and a points- and record-keeping system. Electronic Bookshelf was very successful and several competing reading management programs were soon developed, including Accelerated Reader, Reading Counts!, BookSharp, and That's a Fact, Jack! (Everhart, 1998). Accelerated Reader (AR) is now the most popular reading management program in the United States and in the world (Renaissance Learning, 2008). Reading Counts! is the second-most popular reading management program (Chenowith, 2001).

Reading Counts! and Accelerated Reader work on similar principles. Children are first given a test to assess their reading level. Then, they select and read books from a range of options at their level that the school has purchased for its library. After reading the book, they return to the school-based computer and take a brief comprehension quiz. If they pass the quiz, students are directed to choose other books at the same level and, eventually, books at increasing levels of difficulty (Grenawall, 2004). Software tracks student progress by recording points

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earned for each quiz taken. Schools or teachers set the minimum percentage required to pass quizzes (which can range from 60% to 85% correct answers).

Implementation of reading management programs is expensive, requiring investment in hardware, software, and books. Accelerated Reader, for example, charges a one-time school fee of $2,799 with an additional $1,000 per year for every 250 children enrolled (Renaissance Learning, 2008). What Works Clearinghouse (2007) estimates school's annual fees to range between $3,000 to $10,000. In contrast, start-up costs for Reading Counts! range from $700 to $3,000 (Scholastic, 2007b). These licensing fees do not include the costs of computers and other equipment, books, or personnel. While this paper does provide information to consider in implementation of a reading management program, it does not attempt to provide a cost-benefit analysis as compared to other possible interventions.

Theoretical Basis of Reading Management Programs

In recent years, much attention has been focused on what Paris (2005) calls "constrained" reading skills of alphabetic and phonological knowledge, which involve small sets of knowledge that are mastered in relatively brief periods of development. Although these skills are critical for mastering decoding skills and have led to improved reading test scores in early grades, they are not sufficient to promote comprehension. Indeed, despite growth in reading test scores in the primary grades, there has been little improvement in students' reading proficiency at the middle or high school levels, when "unconstrained" or higher-order skills, such as vocabulary, general knowledge, reading motivation, and reading strategies, explain most of the variance in reading achievement (Paris, 2005).

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To promote these unconstrained skills, scholars and educators have advocated for wide reading, which involves students individually and silently reading as much as possible, both inside and outside the classroom, for their own pleasure, information, and general understanding (Day & Bamford, 1998; NICHD, 2000). In-school independent reading has a variety of forms, including sustained silent reading (SSR), Drop Everything and Read (DEAR), and free voluntary reading (FVR), all of which provide for scheduled time for students to read self-selected books in class for five to 45 minutes daily (Anderson, 2000; Fisher, 2004; Gardiner, 2007; Lee-Daniels & Murray, 2000; NICHD, 2000).

Implementation appears to be critical to the success of in-school independent reading programs, the most popularly cited in the literature of which is sustained silent reading. In the absence of accountability, there may be concerns that children may not read during sustained silent reading time or read books that are either too easy or too difficult to promote reading skill (Stahl, 2004). Furthermore, the success of sustained silent reading in promoting children's reading skills has had mixed support in the literature (*e.g.*, Holt & O'Tuel, 1989; NICHD, 2000; Summers & McClelland, 1982). Providing additional time to read in class in and of itself does not lead to reading improvement (Manning & Manning, 1984; Topping, Samuels, & Paul, 2007). It appears that additional reading time coupled with instructional scaffolding, including teacher-student conferences, peer discussions, assisting children in choosing the appropriate book level, and accountability (i.e., keeping track of the number of pages read) improves children's reading achievement (Kemp & Collins, in press; Manning & Manning, 1984).

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Despite these issues with implementation, an extensive body of research exists on the benefits of independent reading. In eight of ten studies reviewed, free reading programs had a positive effect on reading comprehension as compared to traditional instruction; the other two showed no difference (Krashen, 2004). Free reading programs have also been shown effective in promoting vocabulary development, grammar test performance, writing, and oral/aural language ability (Krashen, 1989; 2004). The positive results of free reading appear to apply robustly to both younger (e.g., Elley & Mangubhai, 1983) and older students (e.g., Mason & Krashen, 1997), to students in a variety of countries around the world (e.g., Elley, 1991; 1998), to students at a low-proficiency level in reading (e.g., Shin, 2001), and to English language learners (e.g., Elley & Mangubhai, 1983; Elley, 1991).

Another way to think about children's independent reading is in terms of out-of-school reading. Differences among children's reading behaviors are truly staggering, in some cases the top 10% of children read five times as many minutes per day as the bottom 10% (Anderson, Wilson, & Fielding, 1988). Furthermore, teachers have a strong influence on children's out-of-school reading which results in whole classrooms reading significantly more outside of school than others (Anderson, Wilson, & Fielding). Teacher guidance in choosing appropriate level books, motivational incentives, time to read in class, and reading aloud to children are all ways teachers can support independent reading. Notably, of all the possible out-of-school activities, reading had the strongest association with children's reading proficiency (Anderson, Wilson, & Fielding).

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Reading management programs seek to capture and amplify the benefits of independent reading programs within the classroom. Through combining free voluntary reading with measures of accountability, they attempt to keep better track of what students read, provide more accurate recommendations as to possible books at the desired reading level, and thus create an overall positive climate for reading at schools. This combination is expected to encourage students to read more often, promote improved reading comprehension, and greater pride in reading among students (Renaissance Learning, 2008; Scholastic, 2007a). Furthermore, reading management programs encourage children to read *outside* the classroom (e.g., through summer reading and parental involvement) and may lend themselves to additional teacher scaffolding (e.g., teacher-student conferences as to book level and accountability in reading books).

Research on Reading Management Software

Despite the prominence of reading management software in U.S. schools, there has been relatively little published empirical research on it (see discussion in Trelease, 2006). We focus our research review on published empirical studies on Accelerated Reader, the most widespread program, as we have not identified published empirical studies on competing products. However, as the second most widespread reading management software program, Reading Counts!, is very similar to Accelerated Reader in content and function, we believe that the results found from research on the use of Accelerated Reader would be applicable to it as well.

We organize our review by three main categories of studies: the implementation of reading management programs, their effects of reading achievement, and their effects on student attitudes.

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Implementation

No educational reform effort can be expected to have much impact if it is not fully implemented. Unsatisfactory implementation has proven to be the downfall of many educational technology efforts (see discussion in Cuban, 2001); particularly those involving reading instruction (see, for example, Slayton & Llosa, 2002). We thus first consider research related to how reading management software is implemented in schools.

Implementation of reading management programs is influenced by a range of actors, including administrators, librarians, computer resource teachers, classroom teachers, parents, and students. A strong school-wide commitment (i.e., a general buy-in from the administrators, staff, and teachers as a whole) in which funds are allocated for the purchase of the software, quizzes, books, and training and time and attention is directed to the program appears to be important. For example, in a study on laptop implementation, Author (2006) found that Accelerated Reader's successful implementation in one school was due in large part to the enthusiasm for technology on the principal's part, his willingness to fund the school library with more than 16,000 books with Accelerated Reader quizzes, and a strong school focus on both reading and the instructional use of technology of which Accelerated Reader was the centerpiece. This commitment seemed to have had a positive effect on students in the school; children there read an average of one book per day, as evidenced by their Accelerated Reader records.

Moreover, school-wide implementation of reading management programs can result in additional funds, time, and attention spent toward supporting student reading which in turn can have a positive effect on student reading achievement. Specifically, Accelerated Reader use

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corresponds to increased numbers of books in school libraries, additional silent reading time in class, increased number of books read by students, and improved reading achievement (see discussions in Topping & Paul, 1999; Trelease, 2001). Additionally, Volland, Topping and Evans (1999) found that treatment groups receiving Accelerated Reader benefited in substantive ways over the control groups in the form of added teacher training and more in-class reading time (i.e., double the amount of daily reading time).

In addition to administrative support, individual teachers, parents, and students must commit to the use of the reading management program in order for it to be successful. High quality implementation of such programs tends to result in greater gains in independent reading. For example, Author (2006) described a teacher who took an active role in promoting voluntary student reading by holding conferences with students to support them in their book choices and reading comprehension and creating a positive classroom environment that celebrated students' reading accomplishments achieved with the aid of the reading management program. Consequently, the children in that classroom read more books. Similarly, Nunnery, Ross, and McDonald (2006) found a relationship between classroom implementation, the amount of time students read independently, and growth in reading achievement. In classrooms where a reading management program was poorly implemented, 80% of the children spent less than 30 minutes per day reading. In high implementation classrooms Accelerated Reader "significantly reduced the negative impact of learning disability status on growth in reading when compared to control classrooms or low-implementation classrooms" (Nunnery, Ross, & McDonald, 2006, p. 15).

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The dual aspects of reading management program implementation (school and classroom factors) highlight the importance of both quantity and quality to independent reading and reading achievement. Quantity refers to the amount of book reading that takes place at home and at school. Quality refers to reading comprehension and teacher support (e.g., importance placed on independent reading within the classroom, teacher guidance with respect to book choice, opportunities for classroom discussion) (Topping & Paul, 1999). The combination of quantity and quality seems to be particularly important for older children (i.e., those in grades 6-12) because these students are less likely to read carefully and more likely to read below their reading level (Topping, Samuels, & Paul, 2007).

Reading Achievement

There is general support in the literature for reading management programs' positive effects on reading achievement. In statewide analyses of reading management program implementation, schools that owned Accelerated Reader had higher reading scores (Kulik, 2003). Furthermore, the median effect of three controlled studies indicated that Accelerated Reader use increased reading test scores by 0.43 standard deviations. The six studies that Kulik reviewed are independent evaluations (i.e., not sponsored by the parent company) which is important, considering that the Renaissance Learning web site contains numerous developer-sponsored reviews all of which describe above-average gains in reading for users of Accelerated Reader.

A few studies have examined the use of reading management programs with sub-populations of students who are typically considered at-risk for low academic achievement. Johnson and Howard (2003) found the use of Accelerated Reader correlated with improved

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reading skills of urban inner-city students. The number of Accelerated Reader points accrued predicted reading comprehension and reading vocabulary scores for students in third-, fourth- and fifth-grade. Additionally, McGlinn and Parrish (2002) found English language learners using Accelerated Reader either maintained or increased their reading level over a three month period. Furthermore, these students dramatically increased the number of books read each month, from an average of two to 21 books. However, it is difficult to discern whether the growth shown by the English learners in McGlinn and Parrish's study resulted from the use of Accelerated Reader or the increased time allotted in class for independent reading, the weekly reading conferences, and the use of extrinsic rewards to motivate reading. Finally, there is a positive relationship between reading management program implementation and reading achievement growth rates for students with learning disabilities (Nunnery, Ross, & McDonald, 2006).

Despite gains in reading achievement across schools, it appears that the use of reading management programs benefit children in the lower grades more than in higher grade levels. Nunnery, Ross, and McDonald (2006) found consistently positive effects on reading achievement of third through sixth grade students in classrooms that used Accelerated Reader as compared to classrooms that received the district-required reading instruction alone. However, third grade students made the highest gains from pre- to posttest than any other grade level and fifth and sixth grade students benefitted the least from program implementation. Similarly, the use of Accelerated Reader does not necessarily lead to long-term increases in reading in older children, despite short-term gains in book reading experienced in the lower grades (Pavonetti, Brimmer, & Cipielewski, 2002). In particular, seventh grade students who had been exposed to

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Accelerated Reader in fifth grade did not have a greater breadth of knowledge of book titles (as a proxy for print exposure) than children who had not used a reading management program in fifth grade.

There is further evidence that gains in achievement related to reading management program implementation are unevenly distributed, as some researchers have found that particular ethnic subgroups of students benefit from Accelerated Reader than others. For example, Sadusky and Brem (2002) found that the use of Accelerated Reader produced better reading outcomes for white students than for minority students. They examined the effects of the implementation of Accelerated Reader and found an 18% overall gain in students' standardized reading test scores over the course of five years. However, when scores were disaggregated by ethnicity, gains in reading scores by Hispanic students were not significant and indeed were much smaller than the gains made by white students.

Student Attitudes

Effective reading programs do not just improve students' short-term reading achievement, but help develop life-long enthusiasts for reading. Thus an important line of research related to reading management programs is their effect on reading attitudes, both in the aggregate and in relationship to particular groups of students.

Teachers, parents, students tend to have positive attitudes toward reading management program implementation (Sadusky & Brem, 2002). Perceptions of specific benefits of Accelerated Reader include positive motivation to read, excitement about reading, achievement growth in reading, and increased amount of reading. However, improved attitude in reading

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does not necessarily cut across all groups evenly. For example, Volland, Topping, and Evans (1999) found girls' attitudes toward reading improved when they used the Accelerated Reader program. However, boys did not show improved attitudes toward reading after use of Accelerated Reader. Everhart (2005) also found gender differences in reading attitudes. Although most students liked Accelerated Reader, girls had a more positive view toward the program than boys.

Despite these positive findings, the use of Accelerated Reader may in some cases adversely affect students' reading attitudes and their perceptions of their reading skills, particularly among low readers. Putman (2005) examined the relationships among students' accrual of Accelerated Reader points, their reading self-efficacy beliefs, and the value they place on reading. Students who accumulated the most Accelerated Reader points showed increases in their reading self-efficacy. In contrast, students who fell in the mid-range of Accelerated Reader point accumulation showed decreases in both their reading self-efficacy and their value of reading. Finally, students who earned the fewest Accelerated Reader points showed the lowest levels of reading self-efficacy and value in reading of all three groups. Although use of reading management programs may encourage children who are successful readers, educators should be aware that program use may discourage less capable readers. These findings suggest that the Matthew effects described by Stanovich (1986) occur not only with reading achievement, but also with reading attitudes. More specifically, children with positive attitudes toward reading may read more and in turn develop even better attitudes toward reading.

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The use of extrinsic rewards is controversial in education, due to its potentially negative impact on intrinsic motivation. However, the use of external incentives, such as pizza and ice cream parties, is fairly common among schools that use Accelerated Reader (Sadusky & Brem, 2002). In a study comparing Accelerated Reader use with and without incentive rewards, Stanfield (2006) found that students' attitudes towards reading declined with the use of these rewards, although the number of books read and AR quiz scores remained the same. Concerns about the use of extrinsic rewards, including the simple reward of passing quizzes, is shared by Krashen (2007), who believes young people are intrinsically motivated to read given access to interesting reading materials and time to read them. In his meta-analysis of more than 20 incentive-based reading management programs, Krashen (2003) concluded that access to books and increased time spent reading are the two factors that lead to better reading, not the use of the Accelerated Reader program.

Other concerns exist with respect to how reading management programs use may affect student attitudes to reading and reading behaviors (see, Pavonetti et al., 2002; Sadusky & Brem, 2002). Principally, these concerns center on student choice of books. For example, students may choose limit their selections to books on the Accelerated Reader book list. In some schools or classrooms, children's grades are tied to Accelerated Reader book reading. For this reason, parents and teachers may discourage children from reading books that are not on the school's leveled list. Furthermore, the kinds of books that are available are limited to those that have quizzes purchased by the school and to books that have been leveled as part of the reading management program. Thus, new books are often unavailable as options to students. Students' reading choices may also be limited with respect to genre, thereby discouraging children from

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reading a wider variety of books. This is unfortunate, because certain genres, such as comic books, may serve as a bridge to more formal types of reading, especially for English language learners (Ujiie & Krashen, 1996). Another problem is that students are not allowed to read books or take AR quizzes out of their range, which may preclude them from reading books that are interesting to them but are out of their assigned level. In addition, some books on the Accelerated Reader lists may not be suitable for younger readers. Pavonetti et al. (2002) provided a distressing example of a third grade child who read a book at his Accelerated Reader level that was clearly inappropriate for his chronological age and contained graphic violence and adult thematic elements.

Discussion: One Piece of the Reading Puzzle

The use of reading management programs has been shown to have a number of potential benefits. Schools that use reading management programs tend to have more books in their libraries, allow more time for sustained silent reading in class, and have students who read more books, than schools that do not use these programs. Furthermore, many studies provided suggestive evidence that these programs may lead to improved student reading achievement.

However, the research record to date is limited, and much more systematic research is needed to determine the use of managed reading programs may play a causal role in improving students' reading achievement. Furthermore, longitudinal studies are required to see whether gains in reading achievement are long-lasting, and much more research is needed to understand the impact of reading management programs on student attitudes. Qualitative research in schools, classrooms and homes can also paint a richer picture of the diverse ways that

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administrators, teachers, students, and parents carry out and respond to the implementation of reading management programs.

Critics charge that reading management programs supplant good reading instruction (see Oppenheimer, 2004). In our view, such criticisms are off the mark. The choice for schools should not be "good reading instruction" vs. "a reading management program." Rather, it should be "good reading instruction with a reading management program," or "good reading instruction without a reading management program." Krashen and others suggest that the benefits of a reading management program can be had without the expense or extrinsic rewards of a reading management program. We would tend to agree with his assessment that it is the sustained time doing extensive reading of interesting and appropriately-leveled material that brings the benefits, not reading management programs per se. However, we are also cognizant of the difficulties of bringing these kinds of reading reforms into schools (more reading time, more library books, etc.) without reading management programs. It is likely that the purchase and deployment of reading management programs encourages administrators to buy more library books and to identify them by the appropriate level, teachers to assign more sustained silent reading, and parents to support such reading more while keeping better track of their children's progress. Thus the most important incentives involved in reading management programs may be those provided for the adults, rather than for the students.

For schools that choose to use reading management programs, several points are worth noting. First, as with other software-oriented educational efforts, implementation is of critical importance. A strong school-wide commitment to teacher training and motivation to invest class

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time in reading management programs is necessary. Those teachers who have a strong commitment to a voluntary reading program will have students who read more. Thus reading management programs must be coupled with a professional development focus on the benefits of voluntary reading.

Second, careful attention should be given to the balance between extrinsic and intrinsic motivation. The research record suggests that an overreliance on external incentives may be counter-productive. We would not counsel teachers or schools to abandon these external incentives, but we do recommend that they be complemented by efforts to foster intrinsic motivation in reading, through, for example, class discussion of the books students read, opportunities for students to write about their books, and other activities that highlight the intellectually stimulating nature of reading.

Finally, parental involvement in reading may play a pivotal role in the implementation of reading management programs. Parents should be informed as to how these programs work, how to provide their children access to leveled books via public or school libraries, and how to help their children choose appropriate books, read every day, and comprehend the texts.

Conclusion

The literature on reading management programs for literacy instruction is thus far limited and too little of it has been conducted independently or published in peer-reviewed outlets. Positive outcomes reported on reading achievement have not yet been demonstrated to persist over time or to be matched by improvement in reading attitudes. More research is needed and especially longitudinal studies, to fully understand the impact of reading management programs.

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Schools that make use of reading management programs can likely amplify their success with effective professional development, an emphasis on intrinsic as well as extrinsic rewards, and increased involvement of parents. Schools that eschew use of reading management programs will want to find other mechanisms to grow their library collections and increase students' time spent on voluntary extensive reading.

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Book Review by Luke Rodesiler, Doctoral Fellow: School of Teaching and Learning, University of Florida

Review of Shimmering Literacies: Popular Culture and Reading and Writing Online

Williams, Bronwyn T. *Shimmering Literacies: Popular Culture and Reading and Writing Online*. New York: Peter Lang Publishing, 2009. 221 pp. ISBN 978-1-4331-0334-6

Despite historical resistance, literacy researchers over the years have acknowledged the value of exploring the potential for using texts from popular culture in the classroom. The work of widely respected professionals such as James Gee, Anne Haas Dyson, and Ernest Morrell, for example, has contributed greatly to present understandings of the value of popular culture as it relates to literacy instruction. Few studies, however, seem to address the ways new technologies and participatory popular culture inform the literacy habits of today's youth across both media and genres. With *Shimmering Literacies: Popular Culture and Reading and Writing Online*, Bronwyn T. Williams works to fill this void by examining the role of popular culture in the online literacy practices of today's students. Building upon relevant scholarship that includes Gunther Kress' exploration of literacy in the new media age, Henry Jenkins' investigation of participatory popular culture, and Colin Lankshear and Michele Knobel's new literacies studies, Williams offers a sound contribution to the field. Using data collected through extended interviews with twenty-one participating first-year university students in the United States and observations of the participants engaging in online literacy practices, Williams investigates the learning that springs from reading and writing with and about popular culture in digital spaces.

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Given the prominence of popular culture texts and new technologies in the lives of many students in the twenty-first century, *Shimmering Literacies* offers valuable insights into the daily literacy practices of today's youth—practices today's teachers must understand if they are to effectively meet students' needs. Though popular culture and the online activities of youth are commonly dismissed as trivial, Williams challenges such notions by guiding readers through an exploration into both how and why online technologies have influenced youth literacy practices. Williams' research into the varied uses of popular culture content in forums, blogs, fan fiction, and the multimodal composition of social networking pages, mashups, and videos, for example, illuminates students' authentic experiences wrestling with traditional issues such as audience, rhetoric, and the social nature of literacy. With an understanding of this research and, subsequently, students' out-of-school literacy practices, teachers will be better equipped to carry out the important work of fostering students' literacy development.

In "Everyone Gets a Say: Changes in Audience and Community," the second chapter of the book, Williams explores how evolving definitions of audience impact the popular culture-influenced literacy practices of today's youth. Calling upon valuable concepts like "collective intelligence" and "affinity spaces," Williams investigates what students can learn from an interactive audience while writing about popular culture online. Citing participants' experiences writing in fan forums, such as those found at *Television Without Pity*, for example, and their own personal blogs, Williams highlights such benefits as "gaining real understandings of the role of audience awareness in writing and the consequences of misjudging an audience" (61). The voices of Williams' participants illuminate their understandings of the importance of considering ethos, accounting for conventions and style, and providing evidence to support one's stance to

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ensure effective composition. Moreover, Williams contends that the audience today's students conceptualize may be very different from the audience many teachers envision. As Williams suggests, the distant, passive audience of yesteryear has given way to an interactive audience that talks back to the author quickly and frequently in the online environment, which has immediate implications for discussions of audience in the twenty-first century classroom.

In addition to changes in audience, Williams explores the evolution of composition using popular culture texts in the online world. In the third chapter, "Looking for the Right Pieces: Composing Texts in a Culture of Collage," Williams posits, "The multimedia capabilities of new technologies and popular culture have given students tools for composing that are changing their ideas about genre, reading, and response" (64). In highlighting participants' practices reading and composing content on their respective *MySpace* and *Facebook* pages, Williams provides readers with clear illustrations of shifts in students' perceptions. Participants' reflections on authorship, ownership, and meaning-making all blossom from and are complicated by student-generated, popular culture-centered texts that reflect a culture of collage, bringing together a mix of popular music, images of prominent figures in popular culture, shots of DVD and album covers, and embedded videos. As Williams reminds us, recognizing students' changing perceptions of literacy and acknowledging the rhetorical skills students employ when sampling from and composing with popular culture content may open doors for conversation in the composition classroom that many teachers have previously neglected to approach.

The fifth chapter, "A Story of One's Own: Social Constructions of Genre Online," expands the investigation to explore the influence of new technologies and the literacy practices made

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possible by participatory popular culture on students' perceptions of traditional literary concepts such as genre and narrative. Citing the popular *Heroes* franchise, for example, Williams highlights challenges to the notion of the stable, single-authored print text as the prominent narrative form. In the case of *Heroes* that Williams offers, the narrative extends far beyond the weekly television broadcast to include trailers, interviews, character biographies, graphic novels, and games, each of which is found online and contains information not seen on television. The "transmedia storytelling" of *Heroes* is extended further still with opportunities for audience members to participate in the narratives. Williams identifies commentaries and fan responses using blogs or online forums, as well as fan fiction, mashups, and machinima as participatory options for audience members who seek to intervene in the narratives generated by mass pop culture producers. Using varied examples and participants' voices, Williams deftly argues that new media technologies have "increased the capability of individuals to read and write in multiple media and multiple genres" (153).

Williams' investigation of participants' use of irony in the texts they create online is another compelling element of the book. In the sixth chapter, "The Pleasure of Irony: Emotion and Popular Culture Online," Williams observes "an understanding and awareness of language use and its effect on audience" (167) in the participants' comments and uses of irony. Posting ironic quotes and providing ironic responses to profile questionnaires on *MySpace* and *Facebook* pages, for example, seem to assist students in minimizing the risks of emotional investment for, according to Williams, "If you can detach yourself from a situation, pretend not to care, say you were only joking…then you lessen the possibility of being hurt or at least letting others know how much you have been hurt" (163). Such widespread uses of irony that serve to pre-empt

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critique are indicative of participants' awareness and understanding of language use. As Williams suggests, the findings of this particular chapter provide composition teachers with a starting point for discussing rhetoric and purposeful language use with their students.

In the closing chapter of *Shimmering Literacies*, "What's on Next: Conclusion and Implications," Williams considers the implications of his study and explores the ways teachers might put students' passion for popular culture to use in the school setting. Thoughtfully, Williams concedes that popular culture texts, when brought into the classroom, are no longer under students' control and are saddled with new, institutionalized meanings instead. Any teacher who has supplemented his or her curriculum with music, film, or other popular culture texts can surely attest to Williams' admission. He does, however, remind us, "It is possible to connect what we know about rhetoric and literacy with what they [students] are learning through popular culture without robbing them of their pleasure in the latter" (197). Based on this particular study, it is Williams' contention that teachers must facilitate student engagement "in work that draws on the playful, collaborative, intertextual, and multimodal qualities of participatory popular culture—and allow students to have some control of the nature and direction of their projects" (197) in order to successfully adapt students' out-of-school expertise to today's classrooms.

Williams' work investigating the role of popular culture in the online literacy practices of today's students effectively illustrates the vast ways students make meaning and perform identity-defining acts while engaged in reading and writing online. With the thoughts and reflections of participating students threaded throughout, *Shimmering Literacies* details students'

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immersion in participatory popular culture and their shifting perceptions of literacy. Though popular culture texts have a history of being dismissed in the field of education, Williams makes a valuable contribution to popular culture scholarship that is sure to compel educators to learn more about the rhetoric of participatory popular culture and related texts, prominent influences on the literacy practices of today's students.