RSS as a Course Information Delivery Method

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Abstract

Technology has changed the way students interact with instructors as social networking and collective intelligence become primary facilitators of course information. One such method emerging with each new web creation is the integration of really simple syndication (RSS). Although RSS came about in the 90's, it is only in recent years that it has taken on a form of delivery that can easily be applied to the classroom. While dissemination of information is regularly done via lectures and course websites, in this case RSS was implemented to provide students an alternate method of receiving course announcements. This paper details a study in which RSS was implemented into a freshman level course as a method of distributing course announcements. In addition, this paper discusses the findings of the study to determine the usefulness and effectiveness of RSS in the classroom.

1 Introduction to RSS

While the concept for RSS emerged in 1997 with the release of channels in Microsoft's Internet Explorer 4.0 browser, the first version of RDF Site Summary (RSS) emerged in 1999. It is also identified by several other names including Really Simple Syndication, Rich Site Summary, Real-time Simple Syndication, and others.

While it has suffered from "the name game," like many XML-based technologies, it has been comparatively slow to grab a practical foothold on the Web. Although many news and advertising sites are now using RSS for real-time distribution, the base of consumers receiving RSS feeds remains mostly composed of early adopters. A recent nationwide phone survey of over 1,300 Americans, conducted by Pew Internet & American Life Project [2005], showed that only 9% of those online knew of RSS feeds and understood the possibilities that they presented. However, the generation who grew up on computer technology is now quickly adding to the base of people receiving RSS feeds. In fact 12% of Internet users in the United States ages 18 to 29 already have a working knowledge of what the term RSS means [Pew Internet & American Life Project, 2005]. Additionally, the explosion of wireless technologies has helped to fuel this growth. According to BusinessWeek Online [2006], the number of RSS feeds grew from 307,000 in January of 2004 to over 13 million in August of 2005. This is more than 20 times the number of new feeds emerging during the prior period. A SlashDot survey [Hrastnik, 2005] predicts that RSS will continue to grow dramatically in the coming years based upon a survey that they conducted with their user base.

As an Internet technology, RSS is most widely used for the instant organization and distribution of a wide variety of information that are available on the World Wide Web (WWW). Asmus, et. al, tells us that since the early implantations of RSS feeds on the Web, they have become essential web publishing tools providing a simple and easy-to-use interface expanding their appeal to users of all experience and knowledge levels [2005]. RSS works by allowing content distributors to syndicate brief snippets of their content and post it as an RSS (XML) file on the Web. Most RSS files include a title, brief description and a link where the user can follow-up to retrieve the "full-story." Those who wish to receive RSS content use special applications called RSS aggregators to "subscribe" to RSS feeds. Once subscribed to a feed, when a new item is added to an RSS feed, the consumer is immediately notified in some manner. In this way, RSS feeds provide an active information mechanism on the Web whereby consumers can know immediately of distributors' information.

There are a variety of standalone RSS aggregators, and some browsers, such as Mozilla Firefox, include RSS functions within them. It should also be noted that RSS consumption is not limited to desktop applications alone – PDAs, cell phones and other wireless devices can be set up to receive RSS feeds. While the original goals of RSS may be loftier, in practical use organizations are using RSS feeds to create content summaries of their web sites to attract users to come and consume their content. One of the biggest limitations of any web site is the fact that it is basically passive – users must come there to see what's new. RSS, one of many technologies that provide an active method for attracting traffic and getting individual consumer attention, is gaining popularity for this specific purpose.

2 Classroom Need

Although RSS feeds were initially utilized by readers to create individualized syndicated news pages [Asmus, et. al, 2005], their increasing popularity and usage have brought the potential opportunities to the attention of educators in classroom settings everywhere. RSS feeds can serve several uses in a variety of educational settings and provide technology driven students with a plethora of opportunities to individualize their plans of study. With the content published in RSS feeds being immediately available to those with Internet connections [West, et. al, 2006] with a few clicks, the possibilities for RSS in classrooms are endless. From the distribution of course related materials to keeping up-to-date with new research related to the course topics, RSS feeds give students and educators alike the ability to skim the newest and most relevant content quickly [Cold, 2006].

One of the most popular uses of RSS feeds in educational settings, and within the classroom, is to enable and improve student research. With the ability to gather multiple sources on one page, RSS can be a powerful research tool aiding educators and students in performing in-depth research with a few simple clicks [Asmus, et. al, 2005]. It allows students to conduct their research as both individuals and collaboratively in groups by sharing and combining feeds across various sources [Cold, 2006] and encourages the sharing of information. A properly setup RSS feed aids the research process by notifying subscribers and saving the most recent posting of information and current events. They have been compared to conducting research 24 hours a day for seven days a week, only the RSS feed is doing all of the work for the researcher [Richardson, 2005].

The use of RSS feeds in a classroom also allows for a more collaborative learning environment and enhances communication

between educators and students, creating new networks of knowledge. Having a variety of resources available in one, easy to use location, RSS encourages sharing among peers and creates large repositories of knowledge [D'Souza, 2006] that can benefit all users and subscribers. RSS feeds can keep track of discussions and conversation topics, wiki's, newsgroups, interests, and web site updates, as well as build connections with others who have similar interests. The combination of all of these items helps students to build deeper understandings of the presented concepts and enhance their comprehension of the materials above and beyond what is offered in the classroom, creating dynamic learning [West, et. al, 2006].

The ability of RSS to provide the most current information with a single click to students also eliminates their need to visit the required web sites regularly and increases their productivity by cutting down on search times for relevant subjects and news. This instant technology is also ideal for sharing classroom news, announcements, and updates so that students have easy access to the provided information creating "personalized learning objects" [D'Souza, 2006] for each class. Like all web sites, course web sites suffer from passive restrictions. Educators who use the Web for content distribution would say that student attention and motivation is more difficult to obtain due to the hectic schedules many of them have. While most instructors do post announcements to their course web sites, it is questionable how many students actually come to the web site to read the announcements and how many of them actually read the announcements once there.

Realizing this problem, the authors decided to try implementing RSS technology into the courses that they teach. In the spring of 2006, the six courses under the authors' purview were modified to include an RSS feed that was used for announcements for the course to determine the impact on student awareness.

3   RSS Course Announcement System

The following portion of the contribution details the specifics of the RSS system created by the authors. The "system" includes both the interface components as viewed in the browser as well as the ASP scripts that were used to modify the RSS (XML) file.

3.1 Course Announcement RSS Document

An RSS document is written in a consistent and repetitive format that aggregators and feed readers can easily parse into useful headlines. Listing 1 shows the frozen structure of a RSS 2.0 document.

The root or document element of an RSS file is the <rss> element that includes the version attribute and associated "2.0" value. Nested inside the document element is one <channel> element that contains all necessary sub-elements, including the items that make up the feed headlines. The <channel> element is arguably unnecessary given that only one can exist within the document, providing the same affect (that of being a document element) that the <rss> element offers. As noted by Hammersley [2005] and Orchard [2005], three elements are required inside the <channel> element: <title>, <link>, and <description>.

```
<?xml version="1.0" ?>
<rss version="2.0">
<channel>
<title>CGT 141</title>
<link>http://www2.tech.purdue.edu/cgt/courses/cgt141/
</link>
<description>Announcements for CGT 141</description>
<language>en-US</language>
<copyright>Copyright 2006 Purdue University</copyright>
<docs>http://blogs.law.harvard.edu/tech/rss </docs>
<lastBuildDate>Sun, 29 Jan 2006 12:13:01 PM ¬
EST</lastBuildDate>
<item>
<title>Midterm Exam</title>
<description>February 28, 7-8 PM in WTHR ¬
200</description>
<link>http://www.tech.purdue.edu/cgt/courses/cgt141/
</link>
<guid isPermaLink="false">8</guid>
<pubDate>Wed, 11 Jan 2006 08:00:00 EST</pubDate>
</item>
</channel>
</rss>
```

Listing 1: An RSS 2.0 document from the course management system.

3.2 Displaying Announcements

While a minor part of the system, we desired to be able to have the announcements that were in the RSS feed display in the browser as shown in Figure 1. To accomplish this, ASP code was included in the course home page as shown in Listing 2.
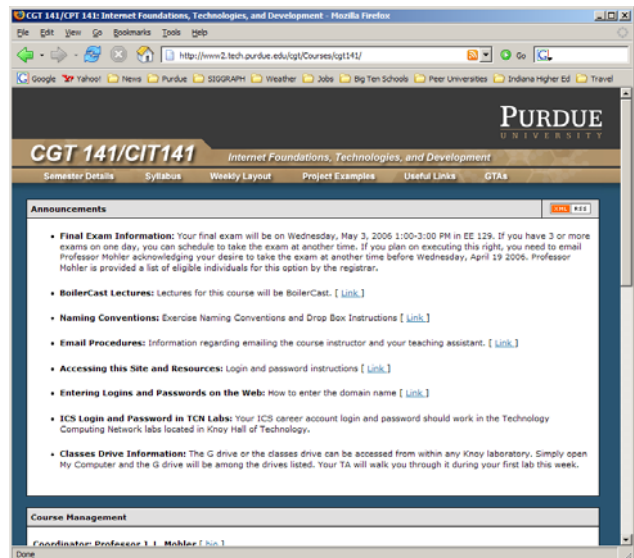

Figure 1: Announcements are integrated from RSS feed into the course home page.

```
<%
Set objXML = ¬
Server.CreateObject("Microsoft.XMLDOM")
Set objLst = ¬
Server.CreateObject("Microsoft.XMLDOM")
Set objAnn = ¬
Server.CreateObject("Microsoft.XMLDOM")
objXML.async = False
objXML.Load ¬
(Server.MapPath("141_RSS.xml"))
%><ul><%
Set objLst = ¬
objXML.getElementsByTagName("item")
noOfItems = objLst.length
For i = 0 To ( noOfItems - 1 )
Set objAnn = objLst.item(i)
Response.Write("<li><strong>" & ¬
objAnn.childNodes(0).text & ¬
":</strong> " & ¬
objAnn.childNodes(1).text)
currentPage = "http://" & ¬
 Request.ServerVariables("SERVER_NAME")¬
& LCase(Request.ServerVariables("URL"))
If objAnn.childNodes(2).text <> ¬
currentPage Then
Response.Write(" [ <a href='" & ¬
objAnn.childNodes(2).text & "'> ¬
Link </a> ] </li><br />")
Else
Response.Write("</li><br />")
End If
Next
%></ul>
```

Listing 2: ASP Code to extract the RSS items and write it in the course home page.

3.3 UI for Editing the RSS Feed

To edit the RSS feed for each course, there were two HTML pages. We designed this "system" so that other faculty could use it
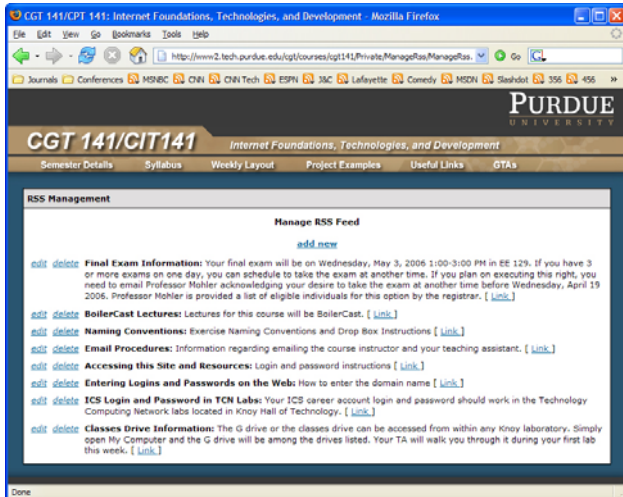

Figure 2: The user chooses to edit, delete or add a new feed item via an HTML page.

and would not have to know how to write RSS (XML) or other web code. Figure 2 shows the initial interface screen for editing the RSS feed items. From this page the user can add, modify or delete items in the feed.

If users choose to edit a feed item, they are presented a form such as is shown in Figure 3. If they choose to delete an existing feed item, they are prompted to ensure they wish to delete it. If they choose to add a new item, they are presented an empty form similar to that shown in Figure 3. Both of the UI screens shown in Figures 2 and 3 use the same ASP script to manipulate the data. The screen shown in Figure 2 uses code similar to that shown in listing 2 and thus will not be reviewed again. The code for taking the input from the form in figure 3 and writing it into the RSS feed is described in the next section.
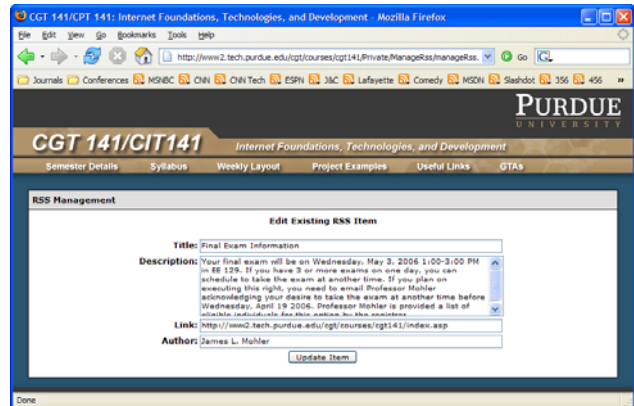

Figure 3: An HTML form is presented if the user chooses to edit a specific feed item.

3.4 Building the Feed with ASP

Active Server Pages (ASP) provides functionality for interacting with the XML Document Object Model (DOM) via instantiation of an instance of the Microsoft XML Core Services Msxml2.DOMDocument class. Using the XML DOM, Listing 3 demonstrates how an additional element can be appended as a child of the <rss> element with relative ease. The inherent issues present with this approach are twofold. First, this example appends the <item> element as a child to the document element of the RSS file, at the same level (sibling) as the <channel> element when it should be a sub-element (child) to <channel>, as noted by Hammersley [2005] and Orchard [2005] earlier. Second, this example does not retain the formatting of the XML document, stringing the appended text together on a single line scrolling off to the right. Attempts at appending to a child node of <rss> results in an error message stating that the operation cannot be performed with a Node of type Element. Instead, appending can only occur at the document element level. As a solution, the management application builds a memory-resident *view* of the RSS feed, appending the new item in sequence prior to the existing items, thus allowing aggregators to display the new item first in the list. Listing 5 shows the code that performs this. The resulting RSS feed from Listing 5, unlike the previous example, contains the new <item> inserted within the existing channel as the first item in the list (compare to Listing 1). Formatting and indentation from the XML file are also preserved to ensure the document remains easy to read as a plain text document (see Listing 4).

```
'Create new RSS elements
Set oItem = oXML.createElement("item")
Set oItemTitle = ¬
oXML.createElement("title")
Set oItemDesc = ¬
oXML.createElement("description")
Set oItemLink = ¬
oXML.createElement("link")
'Initialize the new RSS elements with ¬
values
oItemTitle.text = "Example 1"
oItemDesc.text  = "Simple Append ¬
Without Formatting"
oItemLink.text  = ¬
"http://www.tech.purdue.edu/cgt/"
'Append the <item> element to the ¬
XML file
oXML.documentElement.AppendChild(oItem)
'Append the subelements to the <item> ¬
element
oItem.AppendChild(oItemTitle)
oItem.AppendChild(oItemDesc)
oItem.AppendChild(oItemLink)
```

Listing 3: Performing a simple XML append using ASP.

```
<?xml version="1.0" ?>
<rss version="2.0">
<channel>
  ...elements omitted for brevity...
<item>
<title>Example 2</title>
<description>Appending a memory-resident
channel</description>
<link>http://www.tech.purdue.edu/cgt/
</link>
<guid isPermaLink="false">9</guid>
<pubDate>Mon, 30 Jan 2006 12:31:45 ¬
EST</pubDate>
</item>
<item>
<title>Midterm Exam</title>
<description>February 28, 7-8 PM in ¬
WTHR 200</description>
<link>http://www.tech.purdue.edu/cgt/¬
courses/cgt141/</link>
<guid isPermaLink="false">8</guid>
<pubDate>Wed, 11 Jan 2006 08:00:00 ¬
EST</pubDate>
</item>
</channel>
</rss>
```

Listing 4: Resulting RSS feed with new item appended.

```
strChannel = ¬
chr(9)&"<channel>"&chr(13)&chr(9)& ¬
"</channel>"&chr(13)
oXML.LoadXML(strChannel)
Set oChannel = oXML.documentElement
oXML.Load(Server.MapPath(XMLFile))
Set oRoot = oXML.documentElement
'Copy beginning elements inside ¬
of <channel>
Set objNode = ¬
oRoot.SelectSingleNode("channel/title")
oChannel.appendChild(objNode)
Set objNode = ¬
oRoot.SelectSingleNode("channel/link")
oChannel.appendChild(objNode)
Set objNode = ¬
oRoot.SelectSingleNode("channel/¬
description")
oChannel.appendChild(objNode)
'...
sTab3   = chr(9)&chr(9)&chr(9)
sTab4   = chr(9)&chr(9)&chr(9)&chr(9)
sItem = ¬
chr(13)&chr(13)&sTab3&"<item>"&chr(13)¬
&sTab4&"<title>"&title &"</title>"¬
&chr(13)&sTab4&"<description>"&¬
description&"</description>"&chr(13)¬
&sTab4&"<link>"&link&"</link>"&chr(13)¬
&sTab4&"<guid isPermaLink='false'>"&¬
guid &"</guid>"&chr(13)&sTab4 ¬
&"<author>"&author&"</author>"&chr(13)¬
&sTab4 &"<pubDate>"&pubDate& ¬
"</pubDate>"&chr(13)&sTab3&"</item>" ¬
&chr(13)
Set oXML2  = ¬
Server.CreateObject("Microsoft.XMLDOM")
oXML2.LoadXML(sItem)
'Append item to memory-resident channel
oChannel.appendChild(oXML2. ¬
documentElement)
'Append the pre-existing <item> elements
Set oItems = ¬
oXML.getElementsByTagName("item")
noOfItems  = oItems.length
For i=0 To (noOfItems - 1)
    Set oAnn     = oItems.item(i)
    Set objNode = ¬
oRoot.SelectSingleNode("channel/item¬
[guid='" & oAnn.childNodes(3).text ¬
& "']")
    oChannel.appendChild(objNode)
Next
'Remove old channel, append new channel
Set objNode = ¬
oRoot.SelectSingleNode("channel")
oRoot.removeChild(objNode)
oXML.save(Server.MapPath(XMLFile))
oRoot.appendChild(oChannel)
oXML.save(Server.MapPath(XMLFile))
```

Listing 5: Building the RSS feed in memory and appending the
channel.

4   Initial Feedback

When the RSS Course Announcement System was first implemented, initial anecdotal comments collected from students suggested that many of the students had subscribed to the course feeds and found them to be worthwhile. To further validate the previous anecdotal data, the authors' intend on tracking usage data associated with the feeds in the fall 2006 semester to gather specific information on student usage and the integration of the RSS Course Announcement System into a specific course. The selected course, CGT 141/C&IT 141, is a required 100-level course for all Computer Graphics Technology (CGT) students entitled *Internet Foundations, Technologies, and Development.* Covering topics such as: various authoring tools, web design, graphical and multimedia formats, commerce, implementation and security issues; the course offers basic introductions and "explores the history, architecture and development of the World Wide Web" [Purdue University, 2006].

At the beginning of the 2006 fall semester, the authors posted an online survey to determine the level of usefulness and effectiveness of the RSS feed for CGT 141/C&IT 141 course announcements. This survey assumed that student participants were are at the beginning of the course and have had minimal exposure to the RSS feed used in CGT 141/C&IT 141 and other similar courses. Approximately 240 students, ages 18 to 22, were eligible to take part in the initial survey. Of those 240, 133 students successfully completed the entire survey by answering all questions to the best of their ability, retuning a response rate of 56%. These students ranged in class levels from freshmen to seniors with 22 females, or 17% of the participants, and 111 males, or 83% of participants, responding. Participants were asked a variety of questions regarding RSS feeds. Questions included, and were not limited to, whether or not participants were familiar with RSS feeds, how often they used RSS feeds, their personal proficiency with RSS feeds, and individual feelings on RSS and the use of RSS for the course to which they were enrolled in.

Initial results show that just over one fourth of the participants, 39%, indicated that they had a previous knowledge of what a RSS feed was. This coincides with the findings of the Pew Internet & American Life Project survey that indicated very few participants in a similar age range, 18 to 29, already had this similar knowledge [2005]. Additionally just over half, approximately 56%, of those same 52 students indicated that had previously used a RSS feed to gather the important information they needed, but only 27% used this technology at least once per week. The majority of participants also commented that they felt the RSS feed integrated into CGT 141/C&IT 141 course could be very beneficial if a proper introduction in how to use RSS feeds was available. Other students indicated that since they were unfamiliar with the concept of RSS feeds they could not accurately judge the potential benefit of the integrated RSS feed to deliver the course announcements.

5   Secondary Survey

At the conclusion of the 2006 fall semester the authors posted a second online survey, a post-use survey, to determine the extended level of usefulness and effectiveness of the provided RSS feed for CGT 141/C&IT 141 course announcements. Students enrolled in this fall semester were given a short introduction into the capabilities of RSS, its use within this particular classroom setting, and the potential effectiveness as well as exposure to the CGT 141/C&IT 141 RSS feed for the entire semester. This second survey assumed that student participants were are at the end of the course and have had minimal exposure to RSS feeds outside of the enrolled CGT 141/C&IT 141 classroom environment. The same 240 students from the initial survey, ages 18 to 22, were also eligible to take part in the secondary survey as offered. Of those 240, 203 students successfully completed the entire survey by answering all questions to the best of their ability and returned a response rate of 85%, a 29% increase in participants from the initial survey. Again these students ranged in class levels from freshmen to seniors with 32 females, or 16% of the participants, and 171 males, or 84% of participants, responding. Participants were asked similar questions to those in the initial survey regarding RSS feeds. These questions again included, and were not limited to, whether or not participants were familiar with RSS feeds, how often they used the RSS feed for this course, how often they used RSS feeds for other information and resources, their personal proficiency with RSS feeds, and individual feelings on RSS and the use of RSS for the course to which they were enrolled in.

The final results showed that three thirds of all participants, or 75%, indicated that they now understood and had a working knowledge of what a RSS feed was with 30% of all participants indicating that they have been using an RSS feed at least once per week for gathering information from available sources. Additionally 42% of all participants indicated that they used the CGT 141/C&IT 141 RSS feed to check for course announcements. Of those participants who noted that they used the provided RSS feed to check for course announcements relating to CGT 141/C&IT 141, 64% indicated that they also regularly use other RSS feeds at least once per week to gather the important information they need from other resources showing that checking the CGT 141/C&IT 141 RSS course announcement system had become apart of their weekly routine.

6   Discussion

In comparing the results from the initial survey to the secondary survey posted at the conclusion of the fall semester, students showed an increased knowledge in RSS feeds and their potential to use this offered technology. The number of participants who indicated they understood the potential offerings of RSS increased from 39% to 75% of participants surveyed. These results from the secondary survey show that with just a short and simple introduction, students were able to comprehend the concept being presented to them and use the technology to their advantage.

However contrary to those results, the minimum of weekly usage only increased in participants from 27% to 30% from the initial survey to the secondary survey. This shows that although students were given a short introduction to RSS within the classroom, they were still hesitant to adopt this technology as part of their daily online regiment. This low increase could also be associated with a variety of alternative causes including those such as low/non-required attendance to the classroom lectures on the day material was covered.

Similar to the low returns seen in the weekly usage of RSS feeds, a low percentage of participants noted that they took advantage of the specific RSS feed that was provided as a resource for course announcements. In the secondary survey, only 42% of all participants in the study noted that they used the RSS feed provided for checking course announcements. This low result can be due to the inactiveness of the feed. CGT 141/C&IT 141 is a course that has a limited number of announcements throughout the running of the course. Researchers predict that a positive

correlation would be seen between the frequency/number of announcements and the number of students who take advantage of the RSS feed as it is provided.

7 Summary

This contribution has provided a novel implementation of RSS for course improvement. As stated, anecdotal student comments have indicated that the RSS feed for course announcements useful. Future work in this area will focus on tracking usage data to determine the number of students using the feeds and how often they click through the RSS feed to the main course web site. Further study and thought will be given to the idea of developing innovative ways of integrating RSS into the classroom in a manner that students benefit and learn from.

This study found that including a RSS feed as part of the course was an effective and useful method of disseminating course announcements Anecdotal data from the students stated that they thought its implementation was useful and could be applied in other courses as well.

References

ASMUS, J., BONNER, C., ESTERHAY, D., LECHNER, A., RENTFROW, C. 2005. Instructional Design Technology Trend Analysis. Retrieved September 21, 2006: http://elgg.net/collinb/files/1136/2967/TrendAnalysisWeb.pdf

BUSINESSWEEK ONLINE. 2005. RSS keeps booming. Retrieved April 13, 2006:http://www.businessweek.com/technology/tech_stats/ rss050923.htm

COLD, S. J. 2006. Using Really Simple Syndication (RSS) to enhance student research. SIGITE Newsletter. 3, 1 (Jan. 2006), 6-9.

D'SOUZA, Q. 2006. RSS Ideas for Educators. Retrieved September 21, 2006:http://www.teachinghacks.com/wp-content/uploads/2006/01/RSS%20Ideas%20for%20Educators 111.pdf

HAMMERSLEY, B. 2005. Developing feeds with RSS and Atom. Sebastopol, CA: O'Reilly Media, Inc.

HRASTNIK, R. 2005. Slashdot survey predicts dramatic RSS growth, while RSS "wars" continue. Retrieved April 13, 2006: http://rssdiary.marketingstudies.net/content/slashdot_survey_p redicts_dramatic_rss_growth_while_rss_wars_continue.php

PEW INTERNET & AMERICAN LIFE PROJECT. 2005. Public Awareness of Internet Terms. Retrieved September 27, 2006: http://www.pewinternet.org/pdfs/PIP_Data_Techterm_aware. pdf

PURDUE UNIVERSITY. 2006. CGT 141/CIT 141: Internet Foundations, Technologies, and Development: Course Syllabus. Retrieved September 21, 2006: http://www2.tech.purdue.edu/cgt/courses/cgt141/syllabus.asp

ORCHARD, L.M. 2005. Hacking RSS and Atom. Indianapolis, IN: Wiley Publishing, Inc.

RICHARDSON, W. 2005. RSS: A Quick Start Guide for Educators. Retrieved September 21, 2006:http://www.weblogg-ed.com/wp-content/uploads/2006/05/RSSFAQ4.pdf#search= %22RSS%3A%20A%20Quick%20Start%20Guide%20for%2 0Educators

WEST, R. E., WRIGHT, G., GABBITAS, B., GRAHAM, C. R. 2006. Reflections from the Introduction of Blogs and RSS Feeds into a Preservice Instructional Technology Course. TechTrends. 50, 4, 54-60.