Does SEO Matter? Increasing Classroom Blog Visibility Through Search Engine Optimization

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Abstract

Educators today motivate learning and foster student engagement through the use of classroom blogs. In this study, we discussed the reasons and benefits of moving classroom blogs to the public, and how Search Engine Optimization (SEO) strategies from industry can help increase classroom blog visibility. We proposed a SEO approach and demonstrated how it could be applied to the design and implementation of classroom blogs for higher education through an empirical study.

1. Introduction

As students become savvy users of Internet technology and social networks, educators today have taken this opportunity to motivate learning and foster engagement through the use of social software such as classroom blogs [4, 19, 21]. Moving classroom blogs to the public benefits both the students and the public audience through knowledge sharing and intellectual interaction. In this study we are interested to find out whether Search Engine Optimization strategies can help increase classroom blog visibility and share the students' learning experience not only with their teacher and classmates, but also with Internet users around the world.

1.1 Internet Users, Search Engine and Website Visibility

The number of Internet users worldwide has reached 1.8 billion in year 2009, among which 240 million are in the U.S. [9]. Majority of Internet users are using search engines to find information online. One significant indicator of the Internet search market is explicit core search, which refers to search that excludes contextually driven searches that do not reflect specific user intent to interact with the search results. In June 2012, Google Sites led the U.S. explicit core search market in March with 66.8 percent market share, followed by Microsoft Sites with 15.6 percent and Yahoo! Sites with 13.4 percent. 17.1 billion

explicit core searches were conducted in June, with Google Sites ranking first with 11.4 billion. Microsoft Sites ranked second with 2.7 billion searches, followed by Yahoo! Sites with 2.2 billion [5]. With such profound usage of search engines, it has become critical to make web pages easy to consume for both humans and for search engine robots when designing a website. Search Engine Optimization (SEO) is a process that can help drive the volume and quality of traffic to a website via search results, therefore increase the visibility of the website [22].

1.2 Social Network, Educational Blogs and Social Constructive Learning

As the number of Internet users continues to rise, social networks such as Facebook, Twitter and LinkedIn are also growing exponentially. Facebook records 955 million monthly active users at the end of June 2012, including 552 million daily active users on average [7]. Social networks and social software provide the opportunity to take social interactions to deeper levels and address learning styles rooted in digital technologies [1].

A blog (i.e. "web log") is a user-published website where posts are made journal-style and displayed in a reverse chronological order. Being social in nature, most blogs often provide options that help improve online visibility and deepen the conversational nature, such as comments, tags, categories, RSS feed, permalinks (human readable and search engine friendly URLs), trackback (blogs referring to each other), and blogroll (a list of links to other favorite blogs). The usage of blogs has been extended from personal web sites to a variety of practices including corporate web sites, content management systems, web/mobile application platforms, and social learning environments. Using blogs in education allows students to reflect on their learning and experiences, share them with peer and public timely, and promote classroom discussion and collaboration.

The connection between the use of social software and learning can be supported by the application of

constructivism and social learning theories [2, 16, 20] and social presence [18] pedagogy in higher education. Classroom blogs support both personal constructivist and social constructivist learning activities, as students create and manage their own blog posts, categories, and pages, and share their blog posts with the instructor, classmates and other public audience. Students' social presence in online education environments positively relates to their perceived learning and satisfaction with the teacher [10]. Similar to online courses, a classroom blog can also provide a virtual learning environment where students establish their social presence by sharing their knowledge and reflection with the instructor, classmates and others who read or comment on their blog posts.

1.3 Options of Classroom Blog Software

1.3.1 Blog as an Integrated Tool in Learning Management Systems vs. Stand-alone Blog.
Mainstream commercial (e.g., WebCT, Blackboard) and open source (e.g., Sakai, Moodle) Learning and Course Management Systems have recently added new tools including blogs, and wikis to support social and collaborative learning. However, access to these tools in these CMS systems, is usually limited to the students, instructor, and teaching assistant within one course. Stand-alone blogs like the one in this study are designed with open registration – the blog posts can be viewed by the public, and any registered user can comment on them. Thus the knowledge created by the student author is shared with not only his instructor and classmates, but also instructors and students from other classes or institutions, his friends and peer, and the general public.

1.3.2 SaaS vs. Self-hosted.
SaaS software vendors (e.g., blogger.com, wordpress.com, edublogs.org) host the blog application on their own web servers, back up both data and system configuration, and provide a basic level of user support. These services are often free and can be upgraded for advanced features such as dedicated professional support, massive media space, no advertising on the blogs, premium themes and plugins. Such on-demand SaaS model is best suited for educators who are not very technology savvy or simply want to reduce the overhead of creating and managing blogs themselves. However because SaaS software vendors own the blogs, it means the lack of flexibility, customizability, and reliability, for example, educators cannot download data for further analysis, install third-party or develop their own themes or plugins. If the blog site is considered spam by the vendor's algorithm it will be taken offline immediately. Alternatively, educators can choose from a variety of open source

blog software (e.g., Wordpress, Movable Type) that are not only free to download and use, but also easy and fast to implement and customize. The open source communities behind the software continuously provide plenty themes and plugins allowing a variety of functions, from external SEO and traffic stats to external RSS feeds, widgets, geo-tracking, and even social sharing. Educators can use HTML and JavaScript to embed flash slideshows, videos and widgets, and create other functions to support specific learning needs. In addition to the blog software, a web server (either a server co-located at an Internet service provider or a web hosting service provider) and a domain name are also needed to make the blog site up and running. The benefit of choosing a web hosting service provider is that the web server software (often Apache), database (often MySQL) and programming language (often PHP or Perl) environment is pre-configured and ready to use; some even offer one-click blog installation; and they provide user support, maintenance and backups as well.

1.3.3 Networked Individual Student Blogs vs. One Collected Classroom Blog.
Educators can choose to set up networked individual student blogs or one aggregated class blog site. Each approach has its own benefits and limitations. The networked individual blogs approach gives students ownership and democracy. Students can determine and customize their own blog site including theme/skin, plug-ins, pictures, and pages. Students can use the blog in the future for other classes, professional, or personal purpose. Students can also follow favorite classmates' blog sites using trackbacks or blogrolls. However, in the case of networked individual blog approach via SaaS (e.g. blogger.com, wordpress.com, edublogs.com), because each blog is set up differently, it is difficult for instructors to support, manage, or grade them. And because each individual blog has a unique URL, therefore students may have problems finding others' blog sites or sharing their own with others. As the number of student users grows such inefficiency worsens. If the educator chooses to self-host Wordpress Multisite, then it bridges a lot of this gap. The sub blogs can be subdirectories rather than needing to be separate domains and plugins exist to aggregate all blog contents into a single homepage posts list as well as a single moderator stream in admin. It does take more technology savvy to work. Alternatively, the one classroom blog approach eliminates several problems that a collection of individual blogs approach posts – it is easier for instructors to support and manage single blog site, and more importantly, it is much easier and more intuitive to share information across the class. Every time

students go to classroom blog site to post something they will notice the posts and comments made by others. Students can easily find related blog posts with tag cloud, categories, or achieves. Moreover, such approach can benefit a larger network of student users by sharing across different classes and class year.

2. Moving Classroom Blogs to the Public

Many studies have found that moving classroom blogs to the public increases exposure, accountability and recognition of one's work [12]. Classroom blogs, especially when publicly accessible through the Internet, make student work available for comment and critique by a much broader audience than the teacher. Awareness of an audience larger than the teacher can lead to increased student motivation and social accountability to produce quality work with respect to content, clarity, and editorial components of their compositions [4, 6, 13]. When made public, classroom blogs can also allow students to target and craft their writing for different audiences (Carlson, 2003). As the student bloggers regularly confront "real" rhetorical situations in a very social, supportive setting [11], interactions with "outside voices" that shared in class discussions led to a more in-depth understanding of the content [19]. On the other hand, public audience also benefit from the knowledge sharing enabled by the blog's public visibility [8].

Benefits and needs aside, there are concerns on the student rights and privacy (FERPA) when moving classroom blogs to the public. A suggestion to the educators who are interested in the adoption is to acknowledge, consult, and obtain supports from their university and department, before making student writing public or considering them in course grade. From a technical perspective, there are a few solutions that can help protect student rights and privacy: the instructor informs the students at the beginning of the class (perhaps even put into writing and have the students sign and keep a copy of the document) that 1) the classroom blog is viewable to the public, 2) they have the option to use a pen name instead of their real names on the classroom blog, and 3) their account remains active even after completing the class, so they can log back in and change their display name at any time they want to, or remove any of the blog posts or comments they have written.

Although moving classroom blogs to the public can be beneficial and feasible, we found no study has focused on how to increase the online visibility of classroom blogs after searching over a hundred related articles in AIS, ACM and IEEE databases and Google Scholar. Fortunately, business organizations in the industry have worked out Search Engine Optimization (SEO) solutions for the problem.

3. Search Engine Optimization

Search engine optimization (SEO) is the practice of altering a website to improve the rankings of that website in popular search engines such s Google, Bing, and Yahoo. Because many visitors discover new websites and brands on these popular search engines, placement in the search results for common searches has become a critical method of advertising for many businesses. In order to optimize a website's placement in the popular search engines, it is necessary to understand the evaluation criteria used by the search engines and improve those aspects of the website. A recent article "Five pillars of SEO in Year 2012" [3] provided the high-level SEO criteria in order of their significance: Inbound Links, Content, Social Mentions, Accessibility, and Usability.

3.1 Inbound Links

According to Google (2010), one should focus on creating great content and promoting his site and links happen on their own, however, link building has inevitably become a critical aspect of SEO today. What really separated Google in the early years from other search engines was its use of inbound links to determine relevancy of a page. Similar to which academic journals are more important based on the number of citations they get in other quality journal articles, the same could be said of website reputation. Not all links are created equal though, for example, CNN.com carries significantly more authority than an unknown blog who itself does not have a good link profile. Each site has value based upon how much link power it has, and thus when it links to another site, it passes a fraction of its link power to another site. The more competitive a key phrase that a site is competing for, the more quality links it requires.

Link building often works the best with a holistic strategy that incorporates all levels of link building, from low value discussion type links to high value directory type links. There are many resources and tactics in the industry that can help build quality links, including but not limit to the following:
1) Use tools provided by SEO software vendors, such as OpenSiteExplorer by SEOMoz, to measure own link performance, find out competitors' link juice, or seek high value sites and ask for review.

2) Build links on good quality and authority sites such as education and government websites, and well-known directories such as DMOZ.
3) Set up a series of micro blogs with content and link them back to the primary website, i.e., link wheels.
4) Build links on popular social networks such as Facebook, Twitter, Goolge Plus, LinkedIn, Yahoo Answers, and StumbleUpon.
5) Publish articles and blog posts in current online magazines and writer's networks, such as EzineArticles, Examiner, Suite 101, gather.com and helium.com, and provide links in the content back to own website.

3.2 Content

It is well known to the media industry that "content is king", where Movies, TV shows, magazines, radio programming and high-quality internet content were viewed as having a significant intrinsic value, and can be moved from one medium to another, increasing its value even further [14]. However Andrew Odlyzko [15] argued that this claim is not quite true. He explained through a series of historical examples why "connectivity has mattered much more than content", and asserted that the Internet will continue growth fueled by commercial communications and social interactions that help deliver the content. Although many still believe that simply posting a lot of great content will result in higher search rankings, based upon the assumption that if the content is truly excellent, it will naturally be discovered by people who naturally link to it and thus reinforce the popularity of that content through linking. Unfortunately, very little content goes viral and garners links, as it would otherwise be convenient to believe. In other words, websites that rank well in search results depend upon not only great content but also the right format and delivery.

Several SEO tactics can help enhance connectivity and increase ranking of web sites like classroom blogs. First, the value of fresh content remains as it keeps search robots coming back to the publishing site more frequently, which can indirectly help to establish higher trust rank with search engines like Google more quickly. For example, it is good practice to have the students post to the classroom blog frequently (e.g., weekly or bi-weekly). Second, search engines like Google crawl and index faster on a blog site if the posts are sent to Twitter or shared through Facebook or Google Plus pages [17]. The more active the owner(s) of a blog site is in these popular social networks, the more readers and search engines bots will be driven to

that blog site. For example, the instructor can set up a Facebook Fan Page and/or Twitter account for the classroom blog and automatically syndicate new blog posts to them. This way, not only the instructor and the classmates, but also the students' friends, families and networks of people may read about their intellectual growth, and share feedback. Third, making sure that each blog post is keyword-driven, and has strong title, categories, tags, and semantic URLs helps search engines like Google crawl the blog site faster and easier.

3.3 Social Mentions

Social presence (or social media) is the latest, SEO strategy. This is because search engines have recently started integrating social mentions in search results. When a user is logged in to Google and performs a search, it will prioritize links that have been 'liked' or 'shared' by people within the user's Google Plus network. Similarly, Bing has partnered with Facebook in social search.

More subtly however, Google influenced by the social networks both directly and indirectly. Social sites like Facebook, Twitter, YouTube, Flickr, and LinkedIn and crawled like any others and profiles containing links on these sites are a direct benefit to the recipient of those links. Indirectly, the promotion of a brand or a story through Twitter or Facebook also results in awareness and additional links by people who see these details. This in turn, benefits the search rankings of the recipient. These effects are further weighted by the visibility or influence of people involved; some have much more social reach and effect than others.

In the case of classroom blogs, if someone 'likes' or 'shares' a blog post on Facebook, or if he/she retweets a post on Twitter, these serve as social validation similar to how inbound links work. If the blog post gets a retweet from someone that is a guru who has many other influential followers in the field, that mention is worth much more and can spread faster and to wider crowd. By connecting to the social networking sites like Facebook, Twitter and Google Plus, classroom blogs can optimize their search engine exposure, and attract more readers and contributors who would also write and comment on the blogs.

3.4 Accessibility

How easily can a search engine find and access a website's content? Keep in mind that until very recently the Google bot could not access any content

that was contained within a Flash file, displayed within an image, or fetched asynchronously with an AJAX call. Parsing Flash and fetching AJAX content are possible now but with heavy negative bias, hence should be avoid to be used to create navigation bar for instance.

But it is more than that. REpresentational State Transfer (REST) is a style of software architecture for distributed systems such as the Web that requires are URIs to be self-documenting with descriptive resource locators and to have predictable and consistent content available at that URI, independent of user sessions or request context. Conforming to the REST constraints is generally referred to as being "RESTful" and is helps to increase accessibility of those online resources both humans and search bots alike.

It is also important to consider how many clicks are required to reach a particular page that might rank. If it takes 4 clicks from the homepage, or if the URL structure implies that a page is buried several layers deep within the site, Google will interpret this to mean the content is not significant content and will discount its value. It also inherits a lot less of the link juice that is going to the homepage.

XML sitemaps give the search engines a complete list of important pages on a website so they can be crawled and indexed, along with additional information about those pages, including how frequently the pages are updated, and how important the pages are. While theoretically the search engines should be able to find all of the pages of a website by following links, it still helps to ensure all documents are discovered by the search bot, are crawled quickly and kept up to date. This is particularly helpful with new websites that haven't yet been crawled, large websites with significant numbers of URLs, or sites with usability challenges that may obscure content from the search engines.

3.5 Usability

Recently, Google began to track user interaction with search results and has begun factoring that interaction back into the search results, creating a usability feedback loop, which is applied to the results of that user but also in aggregate. For example, if result #3 for a given search actually is clicked more often than result #1, there is a good chance that it will begin to move up in the rankings as a result [9]. Other factors such as how long is the user staying on the website after clicking on it, before they return back to the search results to view another listing are beginning

to matter as well. This would be a good indication as to whether they found what they wanted on the site. To a lesser degree, indirect factors began to play into usability rankings too such as how long it takes for a page to load and if the page is dominated by advertisements above the fold. The over-arching takeaway is to focus on creating high quality content that a user would want to return to, and optimizing meta description to make sure the listing seems interesting and is consistent with the content the user will find when the click to the website.

Overall, good content does not always bring an audience. In fact, many dated websites still rank well in the search engine results, while valuable new resources may not. That is often due to inbound links to those site.. Those dated websites may have some good content pre-dates their competition and thus they were linked by many other reputable resources. Those links built through the years act as citations to indicate the content's value and help the website to rank well in popular search engines like Google.

4. Research Design

4.1 Research Question

In this study we are simply interested in answering the question: Can SEO help increase classroom blog visibility?

4.2 Artifact - The MIS Class Blog

To answer this question, we built a classroom blog called "MIS Class Blog" (Figure 1) using WordPress blog software in a LAMP (Linux, Apache, MySQL and PHP) environment. Free, easy to install, use and customize, Wordpress has become the most popular open-source blog software used today. It is supported by a wide community of users and developers, and offers extensive, feature-rich themes, plug-ins and widgets. The MIS Class Blog is designed using a WordPress theme called "Edmin" by Themify, offering multiple layout options, threaded comments, social media and SEO features. On the home page of the original MIS Class Blog, the posts are displayed in two columns on the right; each displays the post date, title, number of comments, blurb, author's name and categories. The full content of the post as well as its comments can be viewed by clicking the title. The left sidebar consists of 3 sections: 1) Categories, which provides an option to browse posts by topics; 2) Archives, which provides an option to browse posts by date; 3) Tags, which provides the option to browse

most popular topics by the significance of the keywords used to tag the posts (the bigger the font size of the keyword in the cloud, the more posts in that topic). In addition, a search bar is provided on top of the page, allowing users to find posts by keywords. An About page, Login link, and an RSS feed link for the posts and comments are also displayed on the top of the page. The About page contains a brief introduction to the blog site, and all the student authors' names,

each linked to posts made by the student, with a dedicated, user and SEO-friendly URL. The sidebar, search box, About page, Login link and RSS link are also displayed in each individual post page as well. All posts on the MIS Class Blog are viewable by public. However, to prevent spamming by machine bots, posting and commenting are restricted to registered users (students) only. Figure 1 shows the blog's home page.
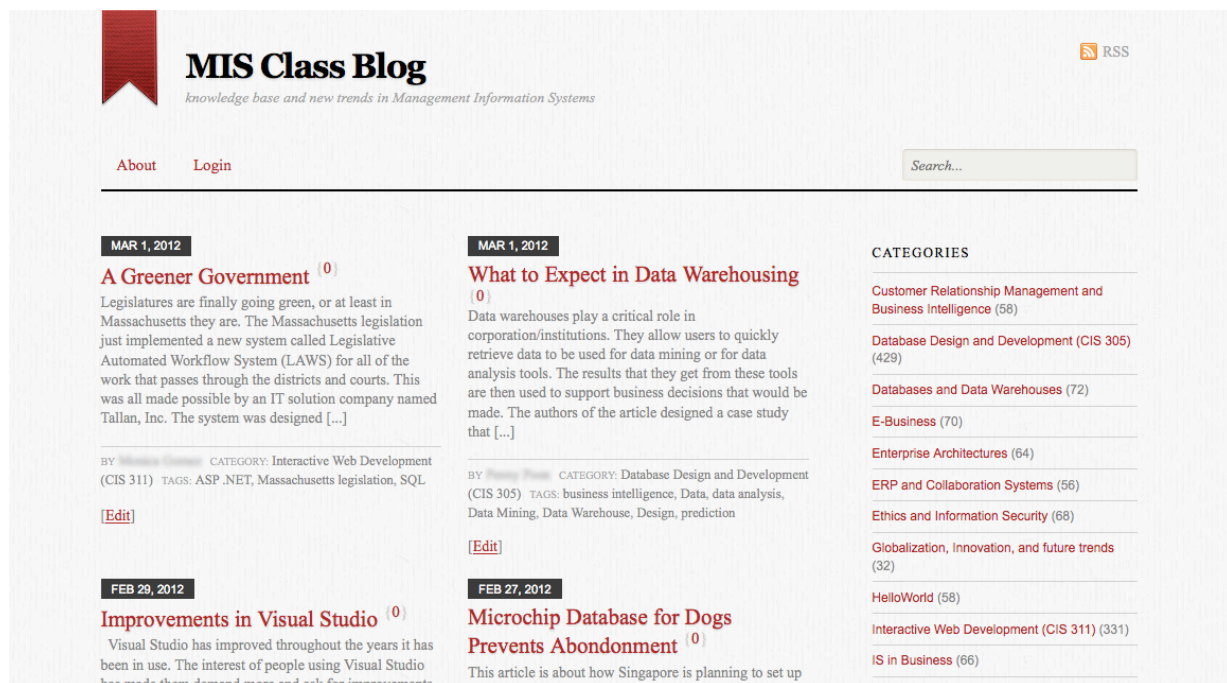

Figure 1. MIS Class Blog

4.3 The Blog Content

During the two-quarter long study, 90 undergraduate students from four computer information systems classes in a U.S. university contributed to the blog. Each week students find a recent article from external sources (e.g., news, online articles, conference proceedings, or journal articles) that is relevant to the course topics, write one blog post about what they have learned from that article, their reflection on this new knowledge, and how it relates to what they have learned in class. Students make at least two comments to their classmates' blog posts each week. As discussed in Section 2, to protect students' rights and privacy, they were informed that the blog site is viewable by public, and that they have the option to use a pen name, and remove their posts and comments anytime.

The most important thing students did for SEO was to write good quality content, which will rank for long tail searches. The second most important thing was providing relevant tagging on the articles. The third is the near-term relevance bump in the search engines that comes from their sharing the article and getting social mentions. Students also learned about good keyword density and proximity, and used SEO plugins including WordPress SEO by Yoast and Keyword Statistics (details provided in Table 1) to help influence SEO effect.

4.4 SEO in MIS Class Blog

There are many ease-to-use and cost effective SEO solutions available to today. WordPress plugins for example, are extensive and feature-rich. As this study is conducted, WordPress.org (provides Wordpress software) has 340,434,688 downloads and 21,039 plugins, among which there are over 1,000 SEO plugins. Most of these SEO plugins are easily

installed, easily customizable, and free. One can easily change the settings without requiring any programming skills. Compared to SaaS based blogs, such as Google's blogger.com, edublogs.org, and WordPress.com (provide free, share-hosting version of Wordpress). Over 20 Wordpress SEO plugins and widgets were added to the MIS Class Blog website in the beginning of the second quarter to help increase the website's visibility. Table 1 describes the details of these SEO features.

Table 1. SEO in MIS Class Blog

Category and Description	Implementation in The MIS Class Blog Website
Inbound Links - All major search engines use linking data in their ranking algorithms. Link building refers to the process of building quality, relevant links to the website, which in turn helps the site achieve higher ranking in search results and drive traffic to the site.	• Create inbound links on the university website (domain authority 83/100). • Blog about the website on well-known educational blogs. • Bookmark the website on popular social bookmarking sites including Delicio.us and StumbleUpon. • Create Google+ page (Google rank their own pages well).
Content - Websites that rank well in search results and retain visitors depend upon not only high quality content but also the right format and delivery.	• WordPress SEO by Yoast - Allow the student author to create SEO friendly meta tags, title tags, indexation, etc. • Keyword Statistics - Check the content of a post or a page for keyword-density as the student author is writing content. • Jetpack After Deadline - An artificial intelligence based spell, style, and grammar checker. • Related Posts - Show related posts on sidebar when displaying a single post. • Tag Cloud - Depict the keyword metadata (tags) on blog posts, and their importance.
Social Mentions - Social sites like Facebook, Twitter, YouTube, Flickr, and LinkedIn drives traffic. Indirectly social mechanisms such as re-tweeting, Facebook Sharing, and Google Plus Likes attributes in search rankings.	• Create Google+ page, Facebook Fan Page • Add Like Box, and Facebook Comment to the website. • Twitter Facebook Share - Allows visitors to share the site easily with many popular social networks including Facebook, Twitter, Google Plus, StumbleUpon and LinkedIn.
Accessibility - From an SEO point of view, making a website accessible to search engines is as important as (or even more than) to human. Because search engines could bring most visitors to the site.	• Google XML Sitemap - Generate a special XML sitemap with complete structure of the blog site, and automatic update of any new content. • WPtouch - Automatically transform the blog into a simple, powerful and elegant mobile theme to increase mobile rankings. • Semantic URLs - Create immediately and intuitively meaningful URLs to both non-expert users and search engines.
Usability - Search engines like Google began to track user interaction with search results and factor that interaction back into the search results, creating a sort of usability feedback look. Indirect factors began to play into usability rankings too such as time to download page and if the page is dominated by advertisements above the fold because they represent usability matters to human.	• Force Gzip - Send compressed response to cut load times. • W3 Total Cache - Add page, object and database caching to increase website loading speed hence improve user experience. • Google Analytics for WordPress - Add Google Analytics to generate detailed statistics about the visitors to the blog site. • WP-stats-dashboard - Display blog's stats graph plus blog traffic, social engagement and social influence. • FeedBurner Stats by DevMD - Monitor daily feed performance.

5. Results and Discussion

5.1 System Usage by Student Authors

During two quarters, 90 undergraduate students from four computer information systems classes in a U.S. public university made a total of 818 blog posts and 1,514 comments during the course of two quarters (20 weeks) on the MIS Class Blog (Table 2). Although the number of posts reduced 8%, the number of the comments has increased near 10%. Note that 1) there are no extra credits or any tangible rewards for making more than 2 comments per week, and 2) most of the comments made during the 2nd

quarter are still by the students, which means the more visible the blog is, the more comments the students made. As discussed in Section 2, it could be that the students' awareness of the blog's public visibility made them feel more motivated and social accountable for what they blog and comment about. Although not the focus of this study, it would be interesting to survey or interview the students to understand more about their motivations and perspectives behind the increase of comments in future study.

Table 2. System Usage

|	# of Authors	# of Posts	# of Comments
Q1	45	426	723
Q2 (SEO)	45	392	791
Change	0%	-7.9%	+9.4%
Total	90	818	1,514

5.2 Search Performance

We compared keyword search and link performance between the two quarters and found significant improvement after implementing SEO: 1) ranks in the search results when using the keyword "MIS class blog" and "MIS blog" in mainstream search engines including Google, Bing and Yahoo!, 2) number of inbound links (websites which contain a link to the searched site) returned when enter the word "link:" followed by the blog's URL in Google, and 3) Total link count by OpenSiteExplorer.org, which is a search engine for links provided by SEOmoz.org, a well-known SEO software vendor.

Although "MIS class blog" and "MIS blog" are not among the most common search terms by Internet users, they allow us to easily compare the search performance before and after SEO implementation. For example, Google Analytics ranked the following top 6 search terms of the MIS Class Blog: "Business application in the cloud", "business innovation in the cloud", "business IT application in the cloud", "business process reengineering", "emotional design", and "Javascript", which are too general to be used for measuring keyword search performance.

5.3 Traffic

Google Analytics (GA) was used to observe differences in traffic to the site that may be attributable to SEO changes made. In order to use GA, a JavaScript snippet is embedded into the HTML of blog theme, which is executed with every page view. Data is then collected until the time we are ready to run reports. A standard GA Audience report was used to compare results of first quarter and second quarters. When setting the date span of the report, we check the 'compare to past' option, enabling us to specify a second span of dates that will be visually compared. The following results (Figure 2), displayed in week view, provide a clear breakaway of data near the middle of the quarters; second quarter (Q2) traffic began to rise while first quarter (Q1) fell. Overall traffic for Q2 was up 35.3% compared to Q1.
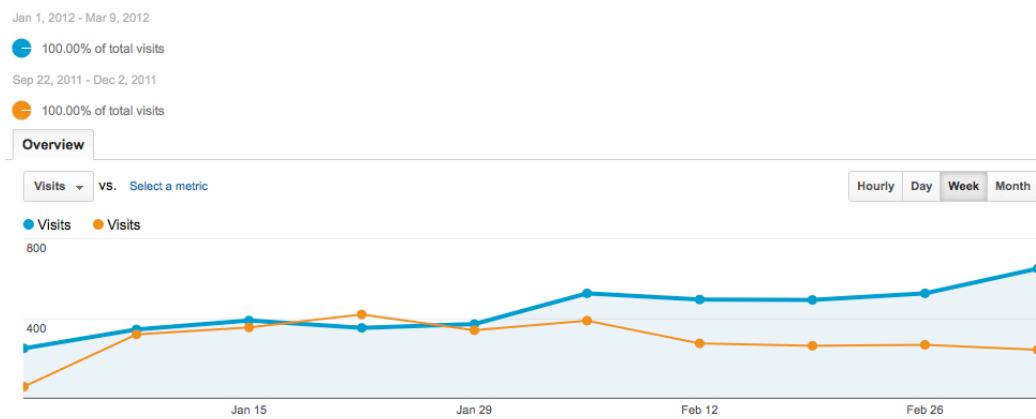
Figure 2. Google Analytics - Total Visits

To better understand the nature of the traffic increases, we used GA's segmentation options to identify subsets of visitors, based upon how they arrived at the website. Visitors that navigate directly to a website and thus carry no identifiable HTTP referrer information are determined to be Direct traffic. Visitors that were referred by known search engines can be segmented as 'Search traffic'. It is reasonable to infer that students are navigating to the site directly, whereas new visitors, who are discovering the site as a

result of our SEO efforts, can be identified as search traffic.

In Figure 3, we can see that overall the direct traffic is following roughly the same pattern over the course of the quarter. This validates that student can be generally identified as Direct Traffic.
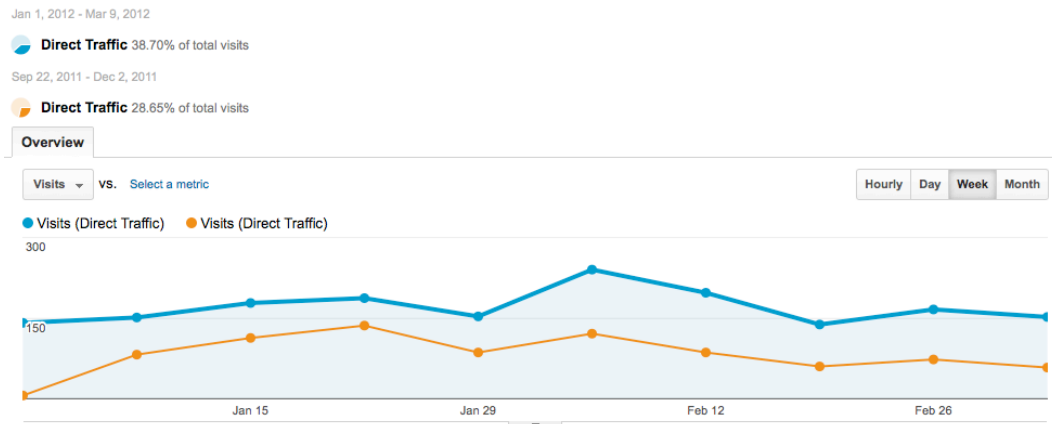

Figure 3. Google Analytics - Direct Traffic

Next, we segmented out the Search traffic (Figure 4). A pattern of consistently increasing traffic is immediately clear. Visitors who are discovering and visiting the website through known search engines are up 150.55%. Unique visitors, defined as a visitor not previously seen at this website by Google*, are up 141.54%. While this unfortunately suggests that a significant number of new visitors are not returning to the site, it also helps to validate however, that the majority of the increase of traffic can be attributed to search engines.

*Google uses cookies to determine whether a visitor has recently visited the site. The _utma cookie is used for tracking this statistic and has a time-to-live of 2 years. While this is a generally reliable measure, cookies however are not always accurate, as they cannot account for visitors using more than one device, or removing cookies over time.
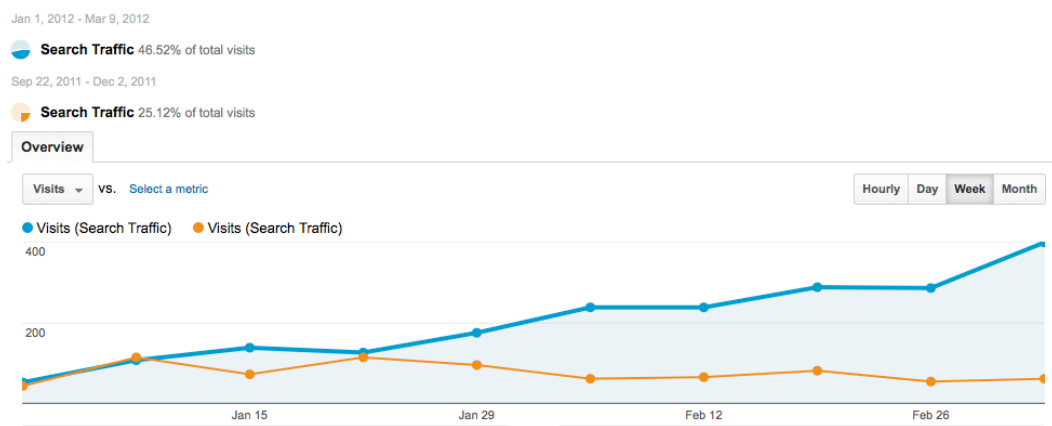

Figure 4. Google Analytics - Search Traffic

6. Conclusion

Moving classroom blogs to the public increases exposure, accountability and recognition of students' work, and benefits general public through knowledge creation and knowledge sharing. Most educators were able to create a classroom blog on the Web, however their blog's main audience remains largely only the students in the class rather than general public. In this paper, we discussed the reasons and benefits behind moving classroom blogs to public, and proposed SEO

guidelines and strategy to increase classroom blog visibility, in five aspects: link building, content, social mention, accessibility and usability. We demonstrated how to design, implement and analyze a SEO-friendly classroom blog for higher education through a two-quarter long case study. The results and analysis showed that SEO helped increase the classroom blog visibility significantly.

For future studies, we propose to segment users into groups using analytic data such as geo-information, or usage trends, and to understand more about the users, and then further optimize the SEO effects of the website based upon the knowledge discovered. Another direction could be using other analytics tools such as heat map to examine individual users' habits, and use such knowledge discovered to improve accessibility, usability, and user experience.

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