MEDICAL SCHOOL PODCASTS: CHOOSING TEACHING TECHNOLOGY BASED UPON EVIDENCE

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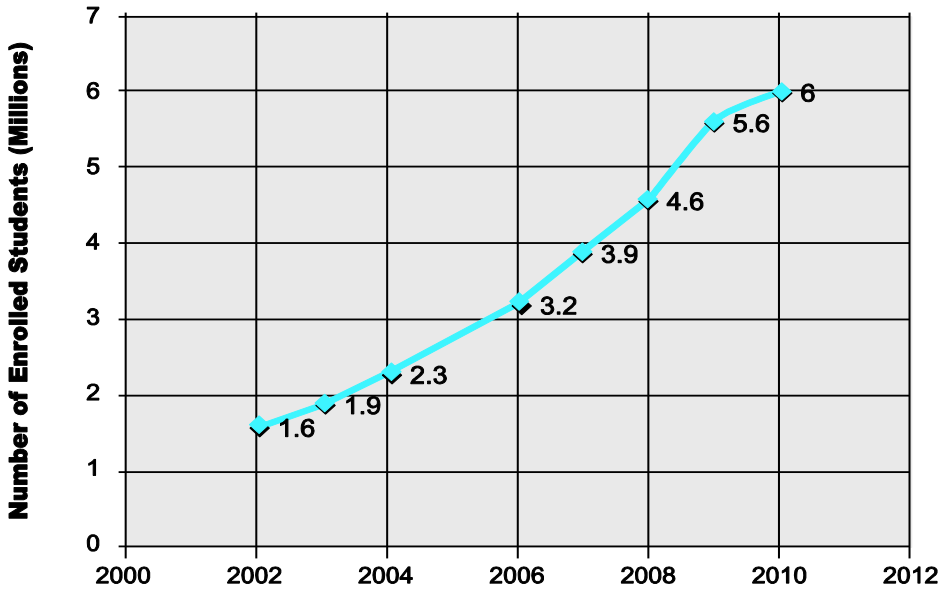
ABSTRACT

Distance learning faculty can now use Internet-based user statistics and metrics to provide insight into usage patterns of various education mediums. The premedical student population, destined to one-day become physicians, have not been studied with respect to multimedia usage.
A premedical topic curriculum was created and published to assess the popularity of various digital communications methods and a head-to-head comparison of preferred media types is described here. The curriculum was developed from surveys and conference feedback from undergraduate premedical majors. A podcast was developed and maintained in iTunes. A website and e-mail list was created and maintained. DVDs and printed material were also available.
During the first 17 months of release of the multimedia curriculum 66,373 audio podcasts were downloaded. There were 11,782 unique visits to the website, 1,618 people signed-up for weekly e-mail, and 33 published videos were viewed 77,661 times. Only 12 people requested the DVD and printed material.
This study may serve as a starting point to compare premedical students' usage of educational media and supports the idea that new media is actually preferred by many students.

INTRODUCTION

Distance learning has dramatically increased and evolved in the last decade (Hwang & Tsai, 2011). Between 2002 and 2010, the number of students enrolled in online courses rose from 1.6 million to over 6 million (Figure 1) (Allan & Seaman, 2005, 2011; Kim & Bonk, 2006). Higher education institutions have historically used virtual private networks to host professors' files on secure servers, often with documents consisting of syllabi, lesson assignments and grades. This has recently expanded to audio and video lecture recordings and podcasts (i.e., new media or on-demand learning) (Bongey et al., 2006).

Figure 1
Growth in Online Higher Education Classes



Coinciding with this technology evolution is the development of impressive metrics tools that can be used to help inform teachers regarding the types of multimedia to use in their courses (Schlager, Farooq, Fusco, Schank, & Dwyer, 2009). Since 2007, tools such as Google Analytics, YouTube, SurveyMonkey.com, Aweber.com email management, and Podpress statistics for audio podcasts are helping to bring objectivity to the previously nebulous internet environment.

These new teaching modalities are also increasing within medical education institutions, but have not been studied in the premedical population (Boulos, Maramba, & Wheeler, 2006). This relatively young population (average age, 22) uses multimedia technology to consume information about everything from hobbies and audio books to learning languages and career advising (Colleges, 2011). This study focused on the research question "What is the most popular multimedia format preferred by premedical students?" Metrics were obtained on the usage of competing methods of multimedia consumption and the results are reported here.

LITERATURE REVIEW

A thorough literature review was conducted on the three content areas that intersect for this study: technology-based education, Internet-user statistics and the premedical student

population. The Association of American Medical Colleges (AAMC) has the best data on the demographics of premedical and medical students in the United States (Colleges, 2011). It can be gleaned from AAMC data that 90% of matriculating medical students are ages 22-27, a relatively young population that is generally associated with heavy Internet usage in the 21st Century.

The dramatic rise in online education modalities is well described. One of the most thorough groups to publish data on this subject is The Sloan Consortium (Allan & Seaman, 2005, 2011). They update education media usage data annually and openly publish it themselves on their website. When comparing this source of media data to others available, it is the authors' opinion that The Sloan Consortium can generally be relied upon compared to other sources not cited in this paper. It is no surprise that essentially every metric available suggests that online education trends continue to rise, not yet showing a plateau phase.

Online education data is a maturing field that appears to keep pace with the technology itself. Numerous journals exist to serve this niche and the available data on various types of teaching technologies has become copious. For example, Hwang and colleagues outlined the technological hurdles the field faces and suggested realistic ways to ensure metrics continue to meet the needs of the education community (Hwang & Tsai, 2011).

No data was found on premedical students related to online learning data. The absence of online learning data on the premedical student population is what prompted this study.

METHODS

Our project was completed in two parts. First, undergraduate premedical majors from the American Medical Student Association's Pre-Med Club at the University of Houston were surveyed using Survey Monkey© in December 2007 to inform the creation of an informative and appealing premedical curriculum. A combination of open-ended questions and multiple choice questions were used to assess the academic and personal issues that they face, and methods for overcoming barriers to entry into medicine as a career. A comprehensive premedical lecture series was created from this input.

Second, the above-mentioned lecture series was produced in different multimedia formats for a head-to-head comparison. A podcast entitled "So, You Want To Be A Doctor?" was developed and maintained in Apple, Inc.'s iTunes platform (for playing on iPods, iPhones, etc.) from March 2008 until January, 2010. In addition, a website and email list was created and maintained during the same time period. Three live conferences utilized the video teleconferencing software GoToMeeting© and the video lectures were made available online for later use, saved on DVD's, and formatted as audio lectures in posted into iTunes at no cost to the students. Physical media such as books, slide handouts, checklists and DVDs were bundled as one item. Students that preferred the physical bundle of these learning materials were required to fill out a simple online form.

To recruit members for our study, the multimedia content was marketed online using free directories, keyword research, and Really Simple Syndication (RSS). RSS allowed each new addition of multimedia content to be added to the collection, with notifications and directory updates to hundreds of media channels and websites - automatically. Metrics were performed using a variety of tools: Aweber.com for email, Google Analytics for website traffic, sign-in sheets for live conferences, Podpress statistics for multimedia downloads, and Yahoo.com for video view counts. Detailed information about how these technologies were synchronized together can be found at http://the-membership-formula.com/.

RESULTS

Table 1 demonstrates that among the 54 premedical students at the University of Houston who attended the three live conferences, 38 (70.4%) responded to the survey. The average age was 26.9 with an age range of 18-45. Of these 38 respondents, 23 were white or Caucasian, six were Asian, two were American Indian or Alaskan, two were Black or African American, two were Hispanic or Latino and one was Native Hawaiian or Other Pacific Islander. Eighteen (47.4%) were female and 20 (52.6%) were male. Two did not respond to the question of ethnicity.

Table 1
Characteristics Of Premed Students That Helped Create The Lecture Series

Category	Number (%)	Characteristic
Age	Total number of students: 38	Average age: 26.89 Median age: 25 Age range: 18-45
Race/Ethnicity	23 (60.53) 6 (15.79) 2 (5.26) 2 (5.26) 2 (5.26) 2 (5.26) 1 (2.63)	White or Caucasian Asian American Indian or Alaskan Native Black or African American Hispanic or Latino Native Hawaiian or other Pacific Islander Chinese
Gender	18 (47.37) 20 (52.63)	Female Male
Country of Adolescence	33 (86.84) 2 (5.26) 1 (2.63) 1 (2.63) 1 (2.63)	United States Canada India Japan Zimbabwe
Number of College Credit Hours	9 (23.68) 9 (23.68) 5 (13.16) 6 (15.79) 4 (10.53) 3 (7.89) 2 (5.26)	> 120 (not in a post-bachelor program) > 120 (in a post-bachelor program) 91-120 61-90 31-60 0-30 Still in high school
Current Degrees	1 (2.63) 6 (15.79) 20 (52.63) 5 (13.16)	Ph.D Master's degree Bachelor degree Associate degree
Undergraduate Major	26 (68.42) 12 (31.58)	Science Non-science
Grade Point Average	Total number of students: 33	3.46 Overall GPA 3.44 Science and Math only GPA
Number of Publications	28 (73.68) 5 (13.16) 1 (2.63) 1 (2.63)	0 1 4 5

	3 (7.89)	7 or more

A total of 33 (86.8%) students were in the United States during adolescence, two in Canada, and one each in India, Japan, and Zimbabwe. One survey respondent had a Ph.D., six had master's degrees, 20 had bachelor degrees and five had associate degrees. Twenty-six (68.2%) had a science major and 12 (31.6%) had non-science majors.

Only 33 students responded to the grade point average (GPA) question and their overall GPA was 3.46. Their science and math GPA was 3.44. Twenty-eight (73.6%) had no publications, five (13.2%) had one, three (7.9%) had seven or more, one had four publications and one had five publications (Table 1).

In this study, 66,373 audio podcasts were downloaded, 11,782 people visited the website, 1,618 people signed up for a weekly email opt-in list, and the videos were viewed 77,661 times (Table 2).

Table 2

Summary Of Media Consumption Data For Video, Audio, Website, Email, And Physical Curricula.

Media Type	Usage Data
Video lessons	77,661 video views
Audio podcasts	66,373 downloads
Website visits	11,782 unique visitors
Email	1,618 opt-in subscribers
Physical bundle of books and DVDs	12 shipments

During the first 17 months of release of the multimedia curriculum to the general public, a total of 66,373 audio podcasts were consumed. More than 95% of these (63,537) podcasts were fed through Really Simple Syndication (RSS) channels into the audio players iTunes, Podpress, Podbean, Google Reader, and other (automatically updating) online directories; and 85% of these were accessed through iTunes. Only 611 (0.92%) of these audio consumption events occurred directly on the http://medicalmastery.com website, while 2,225 (3.4%) were played from other websites and directories.

There were 33 videos published with a total of 77,661 views. The number of views per video ranged from 31 to 13,293 with an average number of views per video of 2,353.

Additionally, there were 14,611 visits to the website, 11,782 were unique individuals. Eighty percent were new to the website. The largest traffic referral source was Google, originating 9,871 (67.5%) of the leads. The second traffic source was "direct" traffic whereby individuals typed the website name directly into the internet browser, accounting for 22.6% (3,302) of the traffic sources.

The website hosting the premedical curriculum had an email opt-in list that students could voluntarily join (the only way to get on this email list was through the website). A total of 1,618 (13.7%) students who visited the website also signed up to be on the email list, with an average weekly email viewing rate of 46.5%. Of the original subscribers, 247(15.3%) unsubscribed from the list.

In contrast to these large numbers, only 12 (0.01%) people from the general public used the physical bundle of books, handouts, and DVD media to consume the content (0.1%), despite the fact that 31.6% of the students surveyed in our pilot sample stated they would use DVDs.

CONCLUSIONS

Audio podcasts and videos appear to be the preferred method of consumption of premedical curriculum online, followed by e-mail lists and directly visiting the author's website. Physical text books, CD's, DVD's and paper handouts are less utilized by the self-directed premedical online learner.

Limitations of our study include the lack of a control population, in which individual students could have been counted more than once in different categories because they were allowed to sign up for more than one media type. A forum was not set up for this study however forums are known to be a popular, competing resource for students to learn about premedical issues (Group, 2012). This study may have poor external validity for undergraduate faculty to apply to their own classrooms. It does, however, serve as a starting point to compare premedical students' usage of educational media and supports the idea that new media is actually preferred by many students.

Future research can be done by individual faculty who simply use existing metrics tools to assess the effectiveness of various multimedia modalities in their own classrooms and distance learning environments. We encourage individual teacher participation and hope that technology will be used to teach disadvantaged and minority students in areas where adequate education may be lacking. For example, rural America has long-struggled with getting adequate numbers of medical school matriculates to serve as physicians in medically underserved areas. Studying the effectiveness of multimedia education and its construct validity may one-day play a key role in the mentorship of a more diverse physician workforce.

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BIOGRAPHY

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