Engaging Students through Web 2.0 Technologies: Capturing the Long Tail of Student Participation

Nitin Aggarwal
San Jose State University
nitin.aggarwal@sjsu.edu

Leslie Jordan Albert
San Jose State University
leslie.albert@sjsu.edu

Eric A. Walden
Texas Tech University
eric.walden@ttu.edu

Shruti Kumthekar
San Jose State University
shruti.kumthekar@students.sjsu.edu

Abstract

This paper applies the relatively new concept of the Long Tail to classroom environments thereby offering a new way of viewing student participation and engagement. We suggest that Web 2.0 technologies such as forums and wikis will appeal to the Long Tail of low-involvement students to increase their interactions within learning environments in the same way that Internet search and recommendation technologies have enabled firms to capture greater value from the Long Tail of less frequently sold products. This theoretical work contributes to the literature by illustrating how these technologies can offer a simple and efficient means of increasing student participation, engagement and learning. We conclude our concept of Long Tail student engagement with directions for future research and practical suggestions for instructors seeking to employ these technologies in their classrooms.

1. Introduction

The majority of today’s college students grew up immersed in technology with few remembering a time before household use of the Internet for communication and information gathering. Due to this high-tech upbringing, students of the ‘Net Generation learn and process information differently than students of prior generations [1] and they possess equally different views of higher education [2]. For example, the ‘Net generation expects learning to be an interactive, collaborative and iterative process with rapid feedback from peers and instructors [1, 3]. These students value an emphasis on hands-on, experiential learning over rote memorization [4]. However, these expectations cannot be accommodated by the traditional “sage on stage” model, in which an instructor lectures and students are passive recipients of information [1, 5]. Instead, recent studies illustrate that active learning, classroom engagement, and student interaction with both peers and instructors are critical to the development, success and retention of today’s college students [2, 6]. The challenge to educators is in creating class environments in which students are comfortable interacting with others and are truly engaged.

In-class discussions are one instructional tool used to increase student involvement. However, participation in discussion often mimics revenue models such as the Pareto Principal (i.e. the 80/20 rule) and retail’s “Long Tail” model [7], where a large proportion of contributions (80%) to discussions are made by a small proportion of students (20%). This is not to say that the majority of students do not contribute meaningfully to the class, but that many students do so much less frequently than would be optimal and still others rarely participate at all. Other pedagogical approaches, such as team activities, role-playing, and “learning by doing” may pull even more students into active learning but some students remain disengaged [8-10]. This is unfortunate as these less participative students may possess valuable insights and opinions that, if shared, would benefit the class as a whole.

How then can educators encourage greater interaction and participation among these disengaged students? To help answer this question we parallel low engagement students in instructional settings and the niche products represented Anderson’s Long Tail model of Internet-based media sales (2006) [7]. We then build upon this parallel to suggest that Web 2.0 technologies, such as forums, wikis and chats, can encourage greater engagement among the Long Tail of low involvement students much in the same way that Internet search and recommender technologies have enabled firms to capture greater value from the Long Tail of less frequently sold products. This
theoretical work contributes to the literature by illustrating how these technologies can offer a simple and efficient means towards increasing participation, engagement and learning among low engagement students.

Our paper is presented here in three stages. First, we discuss Anderson’s (2006) Long Tail model [7] and provide a review of current literature on employing technology to boost student engagement. Second, we develop propositions regarding the ability of Web 2.0 technologies to involve a wider range of students in class discussions than other more traditional instructional methods. We conclude with a discussion of the study’s implications and contributions.

2. The Long Tail and Student Engagement

This section discusses the origins and applications of the Long Tail model of Internet retail sales and offers a brief review of the literature on student engagement.

2.1. The Long Tail

In traditional retail models, companies’ product offerings are dictated largely by economies of scale which require the selling of only highly popular products whose revenues are sufficient to offset their stocking, distribution and marketing costs. According to the Pareto Principle, these top sellers (often referred to as “Hits”) represent as little as 20% of all available products. For example, most movie theaters only show those movies that sell enough tickets to justify their screen time. Similarly libraries and bookstores offer only those books that earn their shelf space. Meanwhile, the “Misses,” products that did not fall into this top selling 20%, are largely abandoned. However, a newer model of retail sales, enabled by the Internet, has emerged where that 80% contributes substantially to the firms’ revenues.

Chris Anderson first proposed the “Long Tail” model in an October 2004 Wired magazine article [11]. Focusing specifically on entertainment and media industries, such as music, books and movies, the Long Tail model suggests that the e-businesses can capture value not only from the top selling 20% of blockbuster products but also from the other, less popular 80% of products. Figure 1 illustrates the differences between the newer Long Tail model and the traditional model of retail sales. Specifically, the step curve illustrates how, in traditional retail stores, most sales are generated from a few top selling items. Meanwhile the much flatter curve of the Long Tail model in Figure 1 shows total sales distributed over a greater number of products and highlighting the bottom 50% of products in particular as underserved niche markets upon which Internet-based firms may capitalize [11]. The Long Tail’s extended market of less popular products is created by the Internet’s ability to (1) lower stocking and distributions costs thereby enabling firms to offer a vast range of products and (2) offer easy consumer access to these product through real-time information generated by search engines, product recommenders and customer reviews [12].

This new model suggests that firms can generate revenue by selling both the Hits and the Misses [7, 11] and “that a huge inventory of unpopular items...can be just as profitable as an inventory of only the most popular items...” p4. [13]. Amazon.com provides an ideal example of a firm generating great revenue from the Long Tail. While brick and mortar locations of Barnes & Noble offer customers more than 130,000 top selling books, Amazon.com offers its customers millions of books, the majority of which do not reside on the Hits list. According to Anderson however, “more than half of Amazon’s book sales come from outside its top [selling] 130,000 titles”. Amazon’s ability to enjoy revenues from less popular items stems from two Internet-based capabilities. First, Amazon possesses cheap and near infinite “shelf space.” As a pure e-business, Amazon does not have to physically stock books but rather can pull-order titles from publishers in real-time based upon consumer demands. Second, Amazon’s highly personalized book recommendations and search tools make it easy for customers to access books and explore their interests far beyond the mainstream offerings [14]. Netflix and Rhapsody have likewise capitalized on the Long Tail of less popular products in the movie and music industries. The concept of the capturing value from the Long Tail has also been applied to context as diverse as blogs, social networking, tourism, and even the development of truth commissions in times...
politic upheaval [13, 15-17]. In this paper we extend this concept further to student engagement and participation in instructional settings.

2.2. Student Engagement

Recent research suggests that student development and success is related to active learning and engagement both inside and outside of the classroom. Instructors are encouraged to move beyond pure lecture to course designs that include group exercises, service learning, case studies, and hands-on experiential learning in order to foster this engagement [4]. According to Limbach and Waugh (2010) [6], one of the best ways for instructors to improve student involvement is to “teach through questioning”: putting questions to the class and encouraging an active dialogue that incorporates students’ contributions and their own feedback into the lesson. To encourage the higher level thinking associated with active learning, students should be given the opportunity to share their ideas and opinions as well as receive feedback that can then be critiqued and incorporated into discussions [6]. To be effective, instructors must create an environment in which students feel comfortable engaging in these activities [6]. While the face-to-face interactions of traditional in-class discussions work well for some students, there are many who feel uncomfortable participating in these settings due to personal attributes such as culture, native language and personal introversion [18]. In this paper we parallel these less involved students with the less popular products of Anderson’s Long Tail retail model and suggest that online forums and wikis may enable instructors to increase these students’ participation much in the same way technology has enabled e-retailers to increase the sales of less popular goods.

2.3. The Long Tail of Student Participation

According to Anderson (2004; 2006) less popular products are not sold in traditional stores due in part to the costs and limits of retail space. For instructional settings the comparable limitation is time [7, 11]. In most courses, instructors may have only three to four hours per week in which to lecture, conduct in-class exercises, discuss assignments and provide feedback. There is simply not enough time for each and every student to share and receive feedback on their opinions, ideas and perspectives particularly in large classes. This restriction on the interactions between peers and instructors lowers student engagement and learning.

Anderson also suggests that the sales of less popular products in traditional retail stores are further reduced because they are rarely offered to customers in a convenient, accessible manner. In the classroom, low involvement students’ own discomfort with face-to-face interactions may make class discussion similarly inaccessible and thus reduce their willingness to participate. Studies of virtual teams suggest that factors such as cultural sensitivities, language difficulties, and personal introversion or shyness that lead to such discomfort may be mediated by technology [19-21]. In Figure 2 below we illustrate how Web-based technologies can influence student participation much in the way they can influence retail sales by paralleling (1) student participation and sales; (2) highly involved students and popular products; and (3) uninvolved students and less popular products.

In Figure 2, the steeper of the two curves demonstrates how, in traditional classroom settings, the majority of participation is generated by a small percentage of students much in the same way the majority of revenues are produced by a few top selling items in the traditional model of retail sales. With the flatter of the two curves we demonstrate that Web-based technologies may encourage participation from a wider range of students much in the same way that these technologies capture revenues from less popular products in the Long Tail model of retail sales.

In the next section we discuss how forums and wikis may be used to address these factors and increase engagement among traditionally low involvement students.

3. Expanding the Long Tail of Student Participation

3.1. Increasing opportunities for participation by reducing time constraints
In Anderson’s new Long Tail economy, Internet-based retailers possess near infinite shelf-space. By addressing the space limitation that forces traditional stores to offer only the top selling items, technology has made it possible for less popular products to have a presence equal to that of their blockbuster counter-parts. Similarly, online forums can address the time limitations of traditional classroom settings by offering constant and equal access to discussions for all students. Moreover, the asynchronous nature of online discussion allows students who might not have the opportunity to participate in in-class discussions to share their ideas and questions with their peers and instructors at their own convenience. Increased discussion time may benefit the more introverted students and non-native speakers in particular. Introverted students are often under-represented in class discussion because they typically desire time to clarify and vet their thoughts internally before sharing with others. Non-native English speakers often do not participate because of their inability to promptly articulate their thoughts [21, 22]. By extending the time available for discussions and allowing time for the student to consider and formulate their thoughts, online discussion forums permit these students to more fully participate in the learning experience [23].

Additionally, extending student interactions outside of class allows discussions to develop organically and follow the interests of the students. This encourages students to explore their ideas and develop their understanding of course concepts more fully than is possible in class. Even non-class related posts to forums are valuable as they can build a sense community among students, boosting student engagement and learning [22, 24, 25].

Based on the above research, we suggest:

**Proposition 1:** By reducing time constraints, online forums and wikis increase the participation of low involvement students.

### 3.2. Increasing opportunities for participation by improving student comfort

Previous research also suggests that cultural sensitivities, language differences and introversion may all reduce the willingness of students to participate in classroom settings. For example Pimpa (2010) found that students from East Asian Nations (such as China and Japan) are often less comfortable discussing controversial or political topics in class than their American peers [19]. Another study found that Turkish students were uncomfortable challenging fellow students or questioning the instructor as such actions might be interpreted as disrespectful [21]. However, both studies found that virtual interactions allowed these students to “save face” and overcome their discomfort to participate more fully in discussions outside of class [19, 21]. Further, students from collectivist cultures have suggested that discussion forums are enjoyable environments as they seem both collaborative and communal in nature [19].

Beyond cultural concerns, non-native English speakers face their own challenges in face-to-face discussion. In addition to needing more time to articulate their arguments, non-native speakers are often self-conscious about their spoken grammatical correctness. Further, these students often find following rapid discussions difficult. Both synchronous and asynchronous online forums slow the speed of discussions giving non-native speakers the opportunity to review and edit their contributions before sharing them with others and to read others’ posts at their own pace [22, 26]. Schwienhorst (2004) found that these benefits enabled non-native speakers to initiate discussion topics as frequently as native speakers [23]. Kahmi-Stein (2000) found that asynchronous discussions in particular greatly improved engagement among non-native English speaking students [26].

Personality traits such as introversion also factor into students’ comfort level within face-to-face settings. Often these students are anxious to speak up, particularly in large classes, and may be drowned out by their more extroverted classmates. Virtual team studies suggest written discussions such as forums enable introverted students to feel recognized for their contributions and encourage them to further contribute to discussions [20].

Companies such as Amazon and Rhapsody have increased sales of less popular products by offering tailored recommendations and customer product reviews that improve the ease with which customers can access these products. We suggest that forums and wikis can likewise improve the accessibility of class discussions by offsetting some sources of the discomfort less involved students often feel in face-to-face settings.

From these studies, we offer our second proposition:

**Proposition 2:** By reducing students' discomfort with participation, online forums and wikis increase the participation among low involvement students.

### 4. Implications

#### 4.1. For Practice
E-retailers such as Amazon have long enjoyed increased revenues by employing technology to extract value from the Long Tail of less popular products. Similarly, the use of social media to improve communication and knowledge sharing within organizations has been commonplace for some time. Although research suggests that faculty are aware of the benefits Web 2.0 technologies offer their classes, few use these technologies for more than hosting content online \[27\]. Low rates of adoption maybe due to instructors’ own lack of time, skill, funding and comfort with these technologies. Additionally, instructors may believe that students will not use class forums and wikis as some research suggests that the use of certain Web 2.0 technologies, like blogs, are on the decline while the use more interactive social networking technologies are on the rise \[28\]. However, a short, anonymous survey of our own students’ use of class-based forums suggests that these forums may not share blogging’s decline in popularity. Table 1 below provides the items of our pedagogical survey.

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>The forum was helpful</td>
</tr>
<tr>
<td>S2</td>
<td>I participated frequently in the forum.</td>
</tr>
<tr>
<td>S3</td>
<td>I believe I would have learned just as much in this class if we did not have the forum</td>
</tr>
<tr>
<td>S4</td>
<td>I was very involved in the forum this semester.</td>
</tr>
<tr>
<td>S5</td>
<td>I am glad that we had the forum as a class resource.</td>
</tr>
</tbody>
</table>

Table 1: Survey items

Students (n=128) across 4 courses were asked to indicate their agreement with these statements on a seven point Likert-type scale with anchors from Strongly Disagree (1) to Strongly Agree (7). Table 2 below shows a break up of student selected responses as percentages by survey item. The survey statements, as numbered in Table 1, are presented horizontally across the top in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>0.73%</td>
<td>0.74%</td>
<td>8.76%</td>
<td>2.19%</td>
<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>0%</td>
<td>10.29%</td>
<td>13.14%</td>
<td>10.95%</td>
<td>0.74%</td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td>0%</td>
<td>8.82%</td>
<td>24.82%</td>
<td>8.03%</td>
<td>0.74%</td>
</tr>
<tr>
<td>Neither agree or</td>
<td>6.57%</td>
<td>13.24%</td>
<td>18.25%</td>
<td>21.17%</td>
<td>11.11%</td>
</tr>
</tbody>
</table>

Table 2: Survey responses

(S1), 66% students participated at least somewhat frequently in the forums (S2), 58% students were somewhat involved in the forums (S4), and 87% students were glad they had forums as a class resource. For S3, which was negatively worded, only 35% felt they would have learned as much in the class had forums not been used. In addition to these items we asked students how often they read their classmates’ posts and how often they posted their own questions to the forum. Their responses, again in terms of percentages, are provided in Table 3.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Read posts</th>
<th>Post Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1.47%</td>
<td>7.35%</td>
</tr>
<tr>
<td>Less than Once a Month</td>
<td>4.41%</td>
<td>14.71%</td>
</tr>
<tr>
<td>Once a Month</td>
<td>3.68%</td>
<td>20.59%</td>
</tr>
<tr>
<td>2-3 Times a Month</td>
<td>12.5%</td>
<td>26.47%</td>
</tr>
<tr>
<td>Once a Week</td>
<td>16.91%</td>
<td>22.06%</td>
</tr>
<tr>
<td>2-3 Times a Week</td>
<td>45.59%</td>
<td>8.82%</td>
</tr>
<tr>
<td>Daily</td>
<td>15.44%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 3: Frequency of Use

As Table 3 reveals, 78% students read the forums at least once a week and 15% of students referred to the forums daily for information. Further, 30% students posted their own questions to the forums at least once a week and 58% posted several times a month. The results summarized in Tables 2 and 3 suggest that the majority students recognize the value of forums as learning resources and illustrate that these technologies are, in fact, used by students as supplements to their in-class work.

Although more research is needed to confirm recommendations regarding the efficient and effective use of these tools in college courses, applicable lessons from industry do exist. First, the value of class forums and wikis will increase as the number of users and posts increase. Much in the way that companies seeking to capture value from the Long Tail must offer both product Hits and Misses, class forums must encourage participation from both high and low involvement students if they are to provide sufficient value to encourage student use. Second, forums and wikis should be moderated with
a very light hand. As many firms that host and moderate their own forums have discovered, over censoring discourages active participation. Third, both of these resources should be well organized and forum in particular should be searchable. Many sales of Long Tail products are enabled by search engines and recommenders that allow consumers to explore their interests and discover new products that exist well outside the mainstream. Similarly, easy to use and search educational forums and wikis enable students to explore divergent views and discover new ideas which can then be incorporated into their own knowledge construction processes.

4.2. For research

In this first paper applying the concept of the Long Tail to instructional settings, we parallel low involvement students to retail Misses - less popular retail products that are rarely viewed as at par with blockbuster items. Instructors must not view low involvement students as being inferior in any way to their more participative classmates. Rather, this parallel highlights the role technology can play in creating opportunities for instructors to further engage these students. The concept of Long Tail is promising in the sense that it allows a different approach to addressing active learning issues both in and out the classroom. More research is needed to fully develop this view of student engagement. First, a testable model of the proposed relationships should be developed and evaluated. Second, studies investigating the usefulness of forums, wikis, and other Web 2.0 technologies in improving meaningful communication and engagement amongst students are needed. Third, future studies examining how the nature of student participation and the format of online communication tools influence engagement are encouraged. For example, asynchronous platforms such as forums and wikis, and synchronous platforms such as chats, provide distinct advantages and disadvantages and should be examined to identify their strengths and weaknesses. Thus, a better understanding of the contexts and student demographics best suited to each of these tools would be valuable. Additionally, the impacts of instructor participation in class forums and wiki on student engagement should also be considered.

5. Conclusion

In order to meet the challenges of educating today’s ‘Net Generation students, many suggest the need to transition higher education from the traditional “sage on stage” model to a model emphasizing greater student engagement. In-class discussions are suggested to be one of the most promising pedagogical tools for facilitating such engagement. However, limited class time as well as cultural sensitivities, language differences and introversion prevent many from benefiting from this approach.

This paper contributes to the literature on student engagement by illustrating how online forums and wikis can offset time and comfort constraints to increase the participation of traditionally low involvement students much in the same way that the Internet has enabled e-retailers to increase revenues generated from the Long Tail of less popular goods. It is our hope that this research will provide a new channel in which researchers may engage in discussions about active learning and student engagement.

6. References


