Exploring major events and the Accumulated user forecasting model to support building Web-based learning communities - preliminary analysis from the School for All

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Abstract

Many researchers used computer technology over the last decade to build a virtual learning community in web-based learning environment. However, building and managing a sustainable learning community remains challenging. One of the goals of this study is to try to identify some major events that affect learning community growth, and another goal is employ these events to develop a regression model for forecasting accumulated effective users in learning communities in the future. This study uses a web-based learning system, as a preliminary analysis environment. Four major events that influence learning communities were identified, and these events were used to establish a regression model for calculating accumulated effective users. Future works will to attempt prove that the forecast regression model affects community building.

1. Introduction

Supported by social constructivist theory, which asserts that students can learn best by participating in the knowledge construction, and by rapid development of information and communication technology, virtual learning communities have become one of the key tools for researchers and instructors in applying technology to facilitate constructive learning.

However, building and sustaining learning communities is not an easy task [1]. Several studies identified the elements that influence learning community success, including interaction quality and quantity, community membership, sense of belonging, and so on [2], but few of them were analyzed using long term observation of existing communities.

National Central University in Taiwan, also designed a web-based learning system, known as the “School for All” [3]. During the past four-years, discovered some things with interesting appearances. Based on experiences gained from applying the “School for All”, this investigation first attempts to extract the critical factors for recruiting and retaining members for learning communities. The second objective is to try to propose a preliminary framework enabling communities to assess their health based on number of new members and accumulated number of active members, and to use the result of purpose forecast future number of active members in a learning community under a certain strategy and future situation.

2. Literature review

Learning community according by Schilchter defines a community as a social grouping with certain properties, including: shared spatial relation, social conventions, sense of membership and boundaries and so on [4]. Carroll and Rosson explained that network communities are born and exist only on the Web, while community networks are real life communities that happen to have associated Web sites [5]. This study limits learning community as a group of people in a web-based network environment or in a virtual cyber space, who share an interest in learning a particular subject.

The first objective of Community-based learning includes Socialization, including socialization from schools, family and society to network virtual community. Another purpose is Knowledge and Experience Sharing [6], such as sharing knowledge, solving common problems and exchanging insights, stories and frustrations.

Good community architecture invites numerous different levels of participation. Motivations vary among community members, with some seeking group’s value, some seeking good human relations, and others seeking the opportunity to improve their professional skills. People always used to think that community members should be encouraged to equally. In fact, since people have different levels of interest and objectives in their community participation, this expectation is unrealistic [7].

Kim studied a successful learning community that
included a membership life cycle [8]. Kim posited that community participants progressed through the following stages: Visitor, Novice, Regular, Leader and Elder. The roles of individuals change over time. Shy visitors evolve into confident contributors; eager students become knowledgeable teachers; and novice players become tournament champions. It is important for community-builders to establish an environment that fosters these basic social roles, while also meeting the changing needs of members as they become progressively more involved in community life.

Thus, according to the above literature survey, this study concludes that building a learning community includes four major elements (EPCS):(1) Effective Events: Such as knowledge sharing, regular meetings, learning workshops, or competition and cooperation are required of participants to maintain a sustainable virtual learning environment.(2) Initiative People: Allows participators to advance their knowledge through lifelong learning and teaching.(3) Quality Courses: Various curriculum and quality course are provided, and the primary teacher must be an excellent coordinator to ensure good group functioning.(4)Well designed System: An environment with user-friendly functions and quality service to support learning activities and bringing people together.

3. Analysis methodology and data collection

During this observed, found the new comers in each month will reduces gradually in the next monthly, also because having these loyal user accumulated, construct new comers get into the learning community. Major data were collected during the pass four year (2000-2003) via observations and log files from online participation were analysed to identify their behaviour.

The event-driven is one of the keys to building a learning community. They require careful planning, skillful facilitation, and timely follow-up. We collect seven events will affect growth of on-line course: We analysis accumulated user number’s relationship with these factors and found some interest clues that descriptive in following paragraph.

3.1 Correlate Analysis

The multiple regression equation for predicting “effectiveness of user accumulation” is found to be as following:

\[ \text{The effectiveness of user accumulation} = 9.57 + 0.446\times \text{(School Opening)} + 0.431\times \text{(Courses Rejected Percentage)} - 0.613\times \text{ (Number of Courses Applied)} \]

The change in numbers of active users can be found based on the actual numbers of newcomers and accumulated users, which correspond to the time slot of Course Contest Event and Course Opening. We can find the change of the active user numbers.

3.2 Accumulated user forecast

The best predictors of “effectiveness of user accumulation” reach statistical significance, and include the following: School Opening, Number of Courses, Courses Rejected Percentage, Course Contest, Workshop, and Promotion News. The multiple regression equation for forecasting “effectiveness of user accumulation”, the data indicated that New Comers (A\text{new comer} : actual number of newcomers in month m) had a higher positive relationship than the Course Numbers. Meanwhile, Course Number remains directly proportion to Course Contest event.

Newcomers who login more than once (A\text{login>1 new comer}) reach statistical significance of “effectiveness of user accumulation”. The life cycles of the newcomers may match a formula as listed in Table 2.

### Table 2: Formual of each month

<table>
<thead>
<tr>
<th>Month</th>
<th>Formula</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>00-3</td>
<td>y= 13.06252 + 0.728505 x</td>
<td>0.982888</td>
</tr>
<tr>
<td>00-4</td>
<td>y= 32.55134 + 0.759369 x</td>
<td>0.977740</td>
</tr>
<tr>
<td>00-5</td>
<td>y= 27.7609 + 0.478264 x</td>
<td>0.955576</td>
</tr>
<tr>
<td>00-6</td>
<td>y= 19.70216 + 0.439176 x</td>
<td>0.929775</td>
</tr>
<tr>
<td>00-7</td>
<td>y= 10.46656 + 0.516566 x</td>
<td>0.977669</td>
</tr>
<tr>
<td>00-8</td>
<td>y= 9.82139 + 0.448284 x</td>
<td>0.949179</td>
</tr>
<tr>
<td>00-9</td>
<td>y= 27.46752 + 0.505502 x</td>
<td>0.878674</td>
</tr>
<tr>
<td>00-10</td>
<td>y= 19.94263 + 0.563082 x</td>
<td>0.966925</td>
</tr>
<tr>
<td>00-11</td>
<td>y= 18.96852 + 0.816719 x</td>
<td>0.907209</td>
</tr>
<tr>
<td>00-12</td>
<td>y= 22.40596 + 0.513191 x</td>
<td>0.859821</td>
</tr>
</tbody>
</table>
4. Finding and Discussion

Through event driven, such as Workshop, Course Contest or Promotion News is all helpfully in attracting new participants. But actually the effect is short-term. Long-term events are: School Opening, Number of Course Applied and Courses Rejected Percentage. We can use these long-term events to build a regression model that use to forecast users in the future. In order to help community builder or events held at right time and suitable scale.

The “effectiveness of user accumulation” had a high positive relationship with school opening and course rejection percentage, and had a negative relationship with Course Number. This demonstrates that although course offering contests will attract many teachers to propose courses, as well as attracting newcomers, too many unqualified courses will turn off new comers. Quality courses offer the only method of enabling accumulated users to remain in the learning environment.

5. Conclusion and future work

From preliminary analysis we have made some conclusions that:

1) Four major elements (EPCS) are indeed to build a learning community

2) Major events that affect the growth of learning community are: School Opening, Number of Course Applied and Courses Rejected Percentage.

3) We use these events to build a regression model to forecast the accumulated user in learning environment.

Furthermore we would like to prove the forecast regression model is truthful affecting the community building. As a leader or elder how can she/he be organized into the learning community as a core member?

6. Reference


