Chapter 4

The Proposed Framework

“You see things, and you say ‘Why?’ But I dream things that never were and I say ‘Why not?”’ - George Bernard Shaw

4.1 Introduction

The development of framework for this study is presented in this chapter. Various criteria and sub criteria used in the framework are given in detail.

4.2 Identifying Criteria and Sub Criteria

One of the most important issues in developing an evaluation framework is to identify the evaluation criteria because in any evaluation framework, the evaluation criteria form the basis of the framework. Criteria can be defined as consisting of characterizing marks or traits, standards on which a decision or judgement may be based, identifying indications and/or a basis of discrimination. The criteria will provide concise guidelines for identifiers that will enable to critically examine websites. The extensive literature review provided a number of quality criteria with different classifications and interpretations. In order to develop an evaluation framework for educational websites, it is not enough to identify the common elements of existing frameworks but the criteria too needs to be analyzed and assessed in the context of educational websites.
In order to identify the evaluation criteria, this study examines 20 major frameworks on information quality from 1996 to 2006. Table 4.1 provides a summary of the most common criteria and their frequency of occurrence in various frameworks.

**Table 4.1 Frequency of criteria in existing frameworks**

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<th>Alexander &amp; Tate</th>
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<th>Zhu &amp; Gauch</th>
<th>Leung</th>
<th>Kahn et al</th>
<th>Liu &amp; Chi</th>
<th>Eppler &amp; Muenzenmayer</th>
<th>Klein</th>
<th>Shankar &amp; Watts</th>
<th>Struengs &amp; Griffin</th>
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4.2.1 Finalizing Criteria in the context of Educational Websites

Once the common criteria in various frameworks were identified, it was important to analyze them in the context of educational websites. This is to assess the quality within the context of its generation and intended use (Shanks & Corbitt, Katerattaakul, 1999) and the attributes of a quality can vary depending on the context in which it is to be used.

Among the 23 criteria Usability, Usefulness, Believability, Amount of data, Reliability were omitted since they come under the sub group of criteria like accuracy, completeness, accessibility, and authority. Since Ease of Operation is a sub group of Navigability and Security as well as Reputation, these two criteria will be more valid for commercial websites. So excluding all those criteria, the remaining criteria were finalized for the study. One more criteria, ‘Multi Language Support’ which is an essential criterion for educational websites were added to the final list. Thus, the finalized list of criteria contains 14 criteria.

In the existing literature, most of the researchers are of opinion that these criteria can be grouped into two categories- Content and Design. Another category, ‘Efficiency’, which was treated as sub criteria in existing frameworks was taken as a major category in this study due to its importance in educational websites where the field is dynamic and the major user community is younger generation.

Both major criteria and sub criteria are defined in the remaining sections.
4.2.2 Defining the Criteria

1. Content

“Content is the most important part of a website. If the content does not provide information needed by users, the website will provide little value no matter how easy to use the site”. (USHHS, 2003)

Content refers to the subject or ideas contained in something written, said or represented. In the more specific context of education, the content is what the website gives to the users. A sound educational website should have quality content or information.

Content has 7 sub criteria- Authority, Accuracy, Completeness, Currency, Relevance, Objectivity and Ease of understanding.

i) Authority

Authority refers to two levels of authorship of the website: the author/owner of the website and authors of various kinds of information available on the web pages. In addition, authority shows that the organization or individual responsible for the website has credible qualification and knowledge. Authority is the extent to which responsibility is taken for information on the website.

ii) Accuracy

Accuracy refers to the extent to which information is correct, reliable and certified free of errors. Accurate content means that the information conforms to certain standard or truth. It should be grammatically and typographically free from errors.
iii) Currency

Currency refers to the extent to which information is sufficiently up-to-date for the task at hand. The date of updating must be given in the home page of the website.

iv) Completeness

Completeness refers to the extent to which information is not missing and is of sufficient breadth and depth for the task at hand.

v) Relevance

Relevance refers to the extent to which information is applicable and helpful for the task at hand.

vi) Objectivity

Objectivity refers to the extent to which information is unbiased, unprejudiced and impartial.

vii) Ease of understanding

Ease of understanding refers to the extent to which information is clear without ambiguity and easily comprehended.

2. Design

Design refers to the arrangement of elements or details in a product. In a website, it will refer to the processes that control a person’s ability to access content. Presenting information in a visually appealing, accessible and easy to navigate manner is key to a successful educational website.

The various sub criteria under design are Visibility, Navigability, Consistent representation and Accessibility.
i) Visibility

Visibility refers to the extent to which the information can be easily located from the homepage.

ii) Navigability

Navigability refers to the extent to which data are easily found or linked to. A good website should include a menu structure for navigating information and services, an interface to enable users to use the website easily.

iii) Consistent Representation

Consistent representation refers to the extent to which information is presented in the same format and compatible with previous data.

iv) Accessibility

Accessibility refers to the extent to which information is available, or easily or quickly retrievable. “The power of the web is in its universal access by everyone regardless of disability is an essential aspect”-(Tim Berners- Lee, W3C, 2003). An accessible website can be used by all Internet users (both disabled and non disabled) regardless of the Internet browser they are using.

3. Efficiency

Efficiency indicates the quickness with which a website meets the information needs of the user. Efficiency consists of three sub criteria- Time behavior, Availability and Multilanguage support.

i) Time behavior

The amount of time the website takes to load or perform tasks. Users should able to open pages within a few clicks.
ii) Availability

An educational website should be available for users to access at any time. It should be available for use 24X7.

iii) Multi Language Support

This is a new criteria added to this framework. “Education is for all”, so language should not be a barrier for educational website access. An educational website should provide the facility for users to choose the language they would prefer to access information.

4.3 Hierarchy Construction

As mentioned earlier, this study uses AHP method for the development of new framework. The first step in AHP method is hierarchy construction. So after selecting and defining criteria and sub criteria, they are formed into a hierarchy as shown below:
4.4 Prioritizing the Criteria

Once the hierarchy is constructed the next step is prioritization of criteria. Prioritization helps to find out the influence of each criterion in educational websites. For prioritization, pair-wise comparison of each criterion is made using the fundamental AHP judging scale (Table 4.2). The pair-wise comparison of the 3 major criteria in relation to the focus is done first to know the importance of each criterion.
Table 4.2- AHP comparison matrix for level 1

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Similarly, by comparing each sub criteria with each other as shown below, comparison matrix for level 2- sub criteria was derived.

AHP comparison matrix for level 2

Table 4.3- AHP comparison matrix for level 2(Content Sub Criteria)

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</tbody>
</table>
Table 4.4- AHP comparison matrix for level 2(Design sub criteria)

<table>
<thead>
<tr>
<th>Level 2 Design sub criteria</th>
<th>Visibility</th>
<th>Navigability</th>
<th>Consistent representation</th>
<th>Accessibility</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility</td>
<td>1</td>
<td>1/3</td>
<td>2</td>
<td>1/4</td>
<td>0.1216</td>
</tr>
<tr>
<td>Navigability</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1/4</td>
<td>0.2373</td>
</tr>
<tr>
<td>Consistent representation</td>
<td>1/2</td>
<td>1/3</td>
<td>1</td>
<td>1/4</td>
<td>0.0866</td>
</tr>
<tr>
<td>Accessibility</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0.5543</td>
</tr>
</tbody>
</table>

Table 4.5-AHP comparison matrix for level 2(Efficiency sub criteria)

<table>
<thead>
<tr>
<th>Level 2 Efficiency sub criteria</th>
<th>Time behaviour</th>
<th>Availability</th>
<th>Multi language support</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0.5278</td>
</tr>
<tr>
<td>Availability</td>
<td>1/2</td>
<td>1</td>
<td>3</td>
<td>0.3325</td>
</tr>
<tr>
<td>Multi language support</td>
<td>1/3</td>
<td>1/3</td>
<td>1</td>
<td>0.1396</td>
</tr>
</tbody>
</table>

Similarly, weights were assigned to the grades through paired comparison (Table 4.6). It is assumed that the grades are same for each of the parent criteria. The websites can be evaluated for each criterion by identifying the grade and there from score for the website can be calculated.
Table 4.6- AHP comparison matrix for level 3

<table>
<thead>
<tr>
<th>Level 3</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Satisfactory</th>
<th>Good</th>
<th>Excellent</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Poor</td>
<td>1</td>
<td>1/3</td>
<td>1/5</td>
<td>1/7</td>
<td>1/9</td>
<td>0.033</td>
</tr>
<tr>
<td>Poor</td>
<td>3</td>
<td>1</td>
<td>1/3</td>
<td>1/5</td>
<td>1/7</td>
<td>0.063</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>1/3</td>
<td>1/5</td>
<td>0.129</td>
</tr>
<tr>
<td>Good</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>1/3</td>
<td>0.262</td>
</tr>
<tr>
<td>Excellent</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>0.513</td>
</tr>
</tbody>
</table>

Thus, the most preferred major criteria for educational websites is its content followed by design and efficiency. The most preferred sub criteria are accessibility followed by time behavior and availability. Figure 4.2 represents the priority of quality criteria in educational websites.
Figure 4.2- Priority of Quality Criteria in Educational websites
4.5 Ranking of the criteria

After prioritization, the criteria were ranked according to the weight they attained while prioritizing. This prioritization and ranking of major criteria and sub criteria form the framework for evaluation of educational websites.

Table 4.7 - Weights of Criteria and sub Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Sub Criteria</th>
<th>Weights</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Authority</td>
<td>0.0904</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Accuracy</td>
<td>0.1132</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Currency</td>
<td>0.1883</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Relevance</td>
<td>0.2541</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Completeness</td>
<td>0.2028</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Objectivity</td>
<td>0.0701</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Ease of understanding</td>
<td>0.0801</td>
<td>13</td>
</tr>
<tr>
<td>Design</td>
<td>Visibility</td>
<td>0.1216</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Navigability</td>
<td>0.2373</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Consistent representation</td>
<td>0.0866</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Accessibility</td>
<td>0.5543</td>
<td>1</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Time behaviour</td>
<td>0.5278</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Availability</td>
<td>0.3325</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Multi language Support</td>
<td>0.1396</td>
<td>8</td>
</tr>
</tbody>
</table>
Figure 4.3 - Evaluation Framework for Educational Websites

Content

Authority, Accuracy, Currency, Relevance, Completeness, Objectivity, Ease of understanding

Design

Visibility, Navigability, Consistent Representation, Accessibility

Efficiency

Time behaviour, Availability, Multilanguage Support
4.6 Conclusion

This chapter described a new framework for evaluation of educational websites. This framework identified the various quality criteria for educational websites as well as prioritized and ranked quality criteria for educational websites. For the development of the framework, a multi decision making tool AHP has been used. So this framework not only evaluated and identified the common dimensions in existing frameworks but also incorporated a new knowledge into the development of framework. Moreover, the lack of a practical framework based on statistical techniques in existing literature has been rectified with the development of this framework.