The Design and Development of an E-Learning System Based on Social Networking.

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Abstract: For many people the internet “e-learning” experience can be rather lonely, lacking as it does, the opportunity for interaction between students and the sense of community and sociability of a well delivered live lecture. As a result the potential benefits from e-learning may fail to materialise because of this lack of student stimulation, involvement and interaction. The basic premises of this project was that students prefer an audio visual rather than solely text based medium, and prefer sociable rather than solitary individual study. It is hypothesised that social networking which builds virtual communities allows connectivity, interaction and in the context of e-learning holds the promise of making learning a more pleasurable interactive process. Based on investigation current issues of e-learning and discovering the possibility of e-learning in social networks, the authors describe the development and evaluation of an online e-learning application intended to enhance the interaction levels of learners in a virtual e-learning environment.

It was hoped that E-learning could be more enjoyable by providing a friendly internet forum where students were able to post problems and ideas connected with their subject domains, pose and answer peer questions, thus generating lively interactive chat, whilst simultaneously developing communication and analytical and support skills. A prototyping process model was applied in designing the application to maximise the user involvement during requirement gathering and design. In the paper, the design process consists of five iterations is described. The application was developed based on the concept of two popular social networking websites, Youtube and Facebook. It was our hypothesis that social network websites have several drawbacks in terms of their educational use. These potential drawbacks are described in the paper. The ways in which the authors allowed for these during the design and development phases of this project is also explained.

The application was evaluated using four evaluation methods, observations, interviews, questionnaires and database records analysis. The results of this evaluation are presented in the paper. It was found that learners had a positive experience of using the application and based on learners’ comments we present a discussion on the possible reasons for this.

Keywords: Web 2.0, e-learning, application development, social networking, Multimedia

1.0 Introduction

The popularity of social networks is increasing and, according to figures from In-Stats reports produced by market analysts, there were 4.5 billion active social networking accounts in 2010 (Portet, 2011). Over the last few years, the popularity of social networks websites soared and opening of accounts has become the norm for the younger generations. This has triggered numerous debates about the possibility of making them a platform for online learning.

The idea of this paper is to explain the design, development and evaluation of an online e-learning application based on social networks. The application is a web-based tool that allows students to learn over the internet. But compared with many existing e-learning options, it is intended to increase the interactions between users and deepen their engagement in their learning, so enriching the process. This gives the potential to increase the efficiency of learning we argue. The application has been developed based on the concept of social network models, Facebook (Facebook, 2011) and Youtube (Youtube, 2011).

In order to understand the issues involved and to obtain the requirements of the system, extensive research on the current e-learning approaches and the possibility of social networking as an e-learning platform was undertaken by the authors. The main concern in e-learning is communities of learners are difficult to form because they separated by distance which implies that each student learns individually without the benefit of stimulating face to face discussion (Rennie and Mason, 2008). Therefore, for many people traditional “e-learning” via the internet can be rather lonely, as it lacks the opportunity for interaction between students and the sense of community and sociability. As a result the potential benefits from e-learning may fail to materialise because of this lack of student stimulation, involvement and interaction.
After looking at the features of social networking and reading the literature, the authors were convinced that it has the ability to form communities of learners to make e-learning more interesting and fun by improving communication and interaction between students as well as the engagement level in virtual community. This suggests possible enhancements to make e-learning processes more effective by improving the communication and interactions by applying the main features of social networking. Therefore an extensive analysis of the weaknesses and strengths of social networks from the e-learning perspective and student’s-teacher’s perspective is vital.

If education and learning systems are to use social networks such as YouTube, and Facebook, we suggest they must be very carefully designed so that the learning goals are central, and various pitfalls avoided. A prototyping process model (Evolutionary method) has been applied during the design and development process to maximise user involvement to ensure the final product meet user’s requirements (Rogers, 2008). In order to test and evaluate the system, the researchers undertook qualitative evaluation of the system with a small group of learners. The evaluation covered 4 aspects; the application’s usability, the user’s attitude while performing a task, whether the application achieves its goals as an e-learning application and the functionalities of the application. The participants were required to provide feedback on each of these aspects, in order to provide information which was the key to the overall judgment as to whether the application had the potential to perform as a satisfactory e-learning platform.

1.1 The current issues of e-Learning approaches

More than 30 articles, journals and case studies were reviewed by the authors to investigate the current issues of e-learning approaches. In addition questionnaires were distributed to learners and 70 responses were received. These provided an insight into the opinions of learners regarding these issues. As a result, the authors considered that many e-learning approaches have had varying degrees of success but often have reduced effectiveness due to lack of helpful interaction and communication among the users. According to Blinco et al. (2004), one of the main issues in much conventional e-learning, apart from the content issue, is that the interface between the user and the material can be uninteresting, the material itself is often difficult to understand and the approaches do not persuading thus cause the learning process to become boring and the learner to lose motivation. In fact, based on our survey findings, text-based traditional approaches such as forums, wikis and blogs can be quite boring because of the low degree of interaction (Shepherd, 2002). We hypothesise that in order to engage the attention of learners, learning should be fun and interesting. However, case studies and the survey result showed that reading thousands of words on computer screen (blogs and wikis) could be quite boring and stressful. This is supported by the survey result when approximately 80% of the respondents agreed that text-based materials are not the best medium for explanations in various fields of education and especially when it comes to courses with a large component of practical work.

Therefore using multimedia delivery methods such as video and audio should be expected to enhance the interaction and communication as well as the engagement level in a virtual community. This is because study materials can be delivered via lecture, mentoring, modelling, presentation and demonstration (Baird and Fisher, 2005). Mantyla (2001) added the materials also can be delivered through simulation and small group discussions. Several other main issues such as lack of historicity elements, restricting the ability to organise the information and irrelevant content were cited by approximately 90% of the respondents in the survey. These were consistently cited as important elements which could be useful in e-learning.

1.2 The benefits of social networking to education

Social networks have its advantages to education. According to Thomas (2010), Bishop, a director of the eLearning company, ‘Glamorgan Blended Learning’, commented that social networking is a persuasive, adaptable and sociable system that could lead to more interesting virtual learning environments. Social networking allows learners to procure information quickly and easily, on any subjects (Iloveindia, n.d). For example users within a student’s network can share information they have brought in from different websites. Therefore, the student can get notification of others’ research in areas of shared interest. In this way they are able to help each other to keep up to date with current information as long as they are connected with other users (Bedel, 2009). The bigger the network, the more information that can be gathered and the more frequently the information shared is updated.
Moreover, social networking encourages users to work in collaboration rather than on their own, increasing group working skills (iloveindia, n.d). In fact, it also can improve the communications skills as well as collaborative with teachers (Xomba, 2010). In addition, it gives the chance to all people to be content creators, managers and distributors (Digizen, n.d). Users can create (role as a content creator), upload (role as a distributor), edit and organise (role as a manager) the materials. These activities support and develop users’ creativity and active participation. Additionally, social networking allows a learner to connect with many other learners from different backgrounds, cultures and experiences. According to Banks et al. (2001) in the University of Washington, “learning occurs when there is diversity in the environment”.

2.0 The design and implementation process

2.1 The requirements

The application’s functional requirements were identified during the investigation of current issues of e-learning described in the previous section. A summary of the application’s requirements identified by the authors is presented in table one below:

<table>
<thead>
<tr>
<th>Number</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>User login and logout</td>
</tr>
<tr>
<td>2</td>
<td>User register account</td>
</tr>
<tr>
<td>3</td>
<td>User forgot password (change password)</td>
</tr>
<tr>
<td>4</td>
<td>Search materials (videos)</td>
</tr>
<tr>
<td>5</td>
<td>Create topic discussion</td>
</tr>
<tr>
<td>6</td>
<td>Upload material(video)</td>
</tr>
<tr>
<td>7</td>
<td>Update video’s details</td>
</tr>
<tr>
<td>8</td>
<td>Update user’s profile</td>
</tr>
<tr>
<td>9</td>
<td>Send message</td>
</tr>
<tr>
<td>10</td>
<td>Reply message</td>
</tr>
<tr>
<td>11</td>
<td>Save video into user’s folders (favourite folder, watch later folder, etc)</td>
</tr>
<tr>
<td>12</td>
<td>Request to joint network/approve/reject requests</td>
</tr>
<tr>
<td>13</td>
<td>Create quiz to be attached with a video</td>
</tr>
<tr>
<td>14</td>
<td>Create notice on blue board.</td>
</tr>
<tr>
<td>15</td>
<td>Download video/materials note</td>
</tr>
<tr>
<td>16</td>
<td>Post comments to a video</td>
</tr>
<tr>
<td>17</td>
<td>Like and dislike video</td>
</tr>
<tr>
<td>18</td>
<td>Reply topic discussion</td>
</tr>
<tr>
<td>19</td>
<td>Red flag notification</td>
</tr>
<tr>
<td>20</td>
<td>Notifications on dashboard</td>
</tr>
<tr>
<td>21</td>
<td>Video statistics</td>
</tr>
</tbody>
</table>
Table 1: List of functional requirements

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>22</td>
<td>Delete messages</td>
</tr>
<tr>
<td>23</td>
<td>Delete videos</td>
</tr>
<tr>
<td>24</td>
<td>Delete topic discussion</td>
</tr>
<tr>
<td>25</td>
<td>Edit topic discussion</td>
</tr>
<tr>
<td>26</td>
<td>Table paging</td>
</tr>
<tr>
<td>27</td>
<td>Display friends suggestion</td>
</tr>
<tr>
<td>28</td>
<td>Display current network’s activities on user’s dashboard</td>
</tr>
<tr>
<td>29</td>
<td>Display current blue board contents on user’s dashboard</td>
</tr>
<tr>
<td>30</td>
<td>FAQ pages</td>
</tr>
<tr>
<td>31</td>
<td>Tool tips for each of the related images, links, menus, etc</td>
</tr>
</tbody>
</table>

The authors also suggest a set of non functional requirements of the system based on a consideration of usability (Miller, 2002). They are listed below:

- Consistency
- Controllable by users
- Effectiveness and efficiency
- Memorability
- Application’s usability design
- Understandability
- Ease of learning

2.2 Application design

There were five iterations involved in the application design phase and each of the iterations involved four stages. The tools that were used in the design were Microsoft PowerPoint and Microsoft Office Picture Manager to draw and edit the page frames. Using this way was considered to be the fastest and cheapest way of achieving the design. In fact, we were able to change and document the design easily with these tools for future reference.

Here is the general process how the application was designed. The first stage was “quick design” which is a stage where the developer plans specific parts of the application in outline. Some designers prefer to sketch the initial design on a paper. From the frames templates created, the developer was able to convert it using HTML and CSS mark-up languages to make it viewable on internet browsers. The designs were then available for formative evaluation in a user centred approach in order to gain feedback. User would write down what he/she liked and what he/she did not like about the design in a feedback session. During the feedback session, new requirements were discovered as well as design improvements suggested. Based on the feedback from the user, the researcher analysed and refined the new design for the existing requirements and also developed a set of new requirements. The figures 1, 2 and 3 below are an example of sequence on one of the prototypes was developed.
During the first iteration, the developer constructed the designs for all the basic requirements gathered in the previous phase. Firstly, the designs were sketched using the Microsoft Word application then converted into mark-up languages using HTML and CSS, so the designs were
viewable on internet browsers. By the end of the process, Microsoft Visual Basic (VB) scripts were added to develop the various prototype systems as dictated by the requirements and feedback. Once all the prototypes were completed, they were exposed to the user to gain additional feedback and also to identify any new requirements that presented themselves.

The basic requirements in the first phase were login and logout pages, signup page, and recovery password and search functionality. By the end of the first iteration, new requirements were gathered and those requirements were based on user feedback and suggestions from the developer. The new requirements were brought to the second iteration and the prototypes were developed in this stage. The prototype development process was exactly the same in the previous phase but with additional requirements. Once the prototypes were completed, they were again exposed to the users in additional sessions to gain feedback. This process was continued until the fifth iteration where the users and developers were satisfied with the designs.

2.3 The implementation

After the design phase had been completed and achieved the required standard, the developer initiated the application development stage of the project. The application mainly has been developed using Microsoft VB.Net under the Visual Studio 2008 environment on the Windows Vista platform. VB.Net is known as a 4th generation language which helps to quicken the development process, and also it is easier to learn compared to some programming languages such as Java and C++. However, JavaScript was also used on some of the pages, for example to assist in the paging process. The purpose of using JavaScript in this application is the fact that it is a powerful script for very efficient and effective tasks, especially paging and form validation. Moreover, AJAX technology (webhostdesignpost, n.d) has been used to help the application perform some of the tasks more effectively and efficiently. For example, VB.Net is unable to refresh a specific part of a page without using AJAX technology. Therefore, AJAX was widely used in developing the application in addition to VB.Net.

In addition to these technologies, an Open Source technology was also used. For example, “JWPlayer” is an Open Source video player which is customisable. “JWPlayer” is not only easy to use, but very easy to install and deploy on the server. The main advantage of “JWPlayer” is that the developer does not have to install Macromedia Flash or Window Media Player component in the Visual Studio environment. The player is able to display many kinds of video format such as .AVI, .MP4, .MPG and others. In the last part of this stage, HTML and CSS integration was undertaken. HTML and CSS are two mark-up languages which are mandatory in any web application development.

The database side of the application was designed using standard techniques and the Microsoft Access 2007 was used as a database for the application. During the development process several software engineering practices were employed to ensure the application’s reliability such as compile and smoke test frequently and manage testing as a continuous process (SPMN, 2010). The developer additionally maximised user involvement during the implantation phase in order to ensure that the requirements and designs were fully synchronised. The figures 4 and 5 below are example screen shots of the application.
Figure 4.0: Screen shot to display a video material

Figure 5.0: Screen shot of a user's dashboard
3.0 Evaluation

The evaluation objectives were:

- **To evaluate the importance of “historicity” element in e-learning**
  Five participants were selected and given five days to use the application. They were required to create their accounts in the application. Once they have created, they had five days to use the application and make interactions with the other users and materials. They can upload videos, comment videos, create forum discussion, create quiz, etc. By the end of period, the authors performed the following methods to evaluate the importance of historicity element in the application.
  - Database record analysis – This was achieved by recording and analysing the interactions made by users as they used the application in order to achieve their objectives and goals. This was instrumental in understanding the importance of the user’s history function in the application.
  - Think aloud – After the end of the evaluation period, participants were required to write a short answer for a set of questions given.

- **To evaluate the ability of a social networking for interactive e-learning environment to increase the interaction levels among the users, as well as with the materials.** The same five participants were given set of questionnaires and required to write a short answer for a set of the questions given to them.

- **To discover how virtual appreciation elements can motivate students to get involved in a team.** The authors asked the same participants by distributing set questionnaires and required to write a short answer for set of the questions given to them related to this issue.

- **To evaluate whether the application achieved its overall goals or not**
  The application’s goals were:
  - To increase users’ interactions and engagement level among the users and materials within a virtual learning community by providing a social networking based e-learning environment.
  - To increase the learners’ motivation to participate in a collaborative team within a virtual learning community.
  - To make the learning process more interesting and fun by using Video and Audio instead of text and images.

3.1 Findings

3.1.1 The importance of “historicity” element in e-learning

Based on the positive feedback obtained, it is suggested that it is one of the key features to be integrated within an e-learning application of this type. One of the key aspects of this feature is that it was able to show the relative popularity of any posting, (materials or other content) by means of a tally count, according to the frequency with which a particular posting is viewed by other learners. This popularity can be viewed on a user’s dashboard, and will tend to steer e-learners towards popular (and arguably useful) material. Interesting material would tend to be selected more often by users and would often lead to a further discussion (through comments posted) among the learners. As we can see in this process, this feature can, in a more subtle way, encourage learners to discover something new as well as to get involved in a virtual group discussion, developing the friendly, virtual community that was one of our objectives at the start of this research as being desirable in an e-learning system. One of the participants commented that by doing this learners could acquire “bonus” knowledge even though the initial intention was to find different information. In fact, it’s believed that this feature could also be especially helpful to those who need direction from others, being non-self starters themselves.

Moreover, this feature also allows learners to look back and view a record of useful information at anytime. The “useful information/activities” might include what they have done in the past, such as items they have revised, videos they have watched, documents
they have created and issues they have discussed. All those activities can help to sustain the learning process through “memory support” prompted by the historical “threads”. In fact, these “threads” we argue, can also assist by making it quicker to access, organise, and recall information. However, it is true to say that privacy is a potential issue that has to be considered. This is because not every learner may like to be “watched” or get “noticed” for what they did in the past. This is an issue for future research.

The second data analysis was based on the application's database record. The application recorded the number of clicks made during the whole history of the interactions on pages and the also records the number of clicks made using the search field at the top of the application page.

Variable a = number of clicks made through the history page --- N(a)  
Variable b = number of clicks has been made using search field --- N(b)

The researcher assumes if N(a) > N(b) means users are mainly relying on feature A to find information within the application. Otherwise users are mainly relying on feature B as their main tool to find information within the application. The finding was that:

N (a) = 114 clicks  
N (b) = 82 clicks

The records show that during the evaluation period the users made 114 clicks through the history page displayed on dashboard whilst 82 clicks were made by the users through search field. This is interpreted as showing that the user’s history page is a very important alternative tool for finding information within the application and indeed that users are attracted more using the history feature more than the search functionality.

3.1.2 The ability of a social networking based e-learning environment to increase the interaction levels among the users, as well as with the materials

According to the feedback from the evaluators, the application had great potential to increase the interaction levels among users as well as between users and the materials. It was likely however that the application would benefit from a few improvements in certain respects. For example too many interactions may cause interference and distractions, especially for users who prefer to learn at their pace and space with just the minimum interactions. However, the application was able to increase both the users’ interactions with other users and also the number of comments made on materials. This was because users were able to contribute videos, images and text based notes, all of which can be downloaded onto hard-disk for further use. Because of this case we suggest that learners have more opportunity for interactions with the materials. This is unlike the materials available on YouTube for example where users do not have the ability to download the videos directly from the website itself. This will likely minimise the learner’s ability to control the materials themselves.

The “Join Network” functionality is another useful feature for learners in our application because it enables the user to block anonymous or other unwanted interactions (forged identity, false expertise, or otherwise unsound opinions and views). This has the potential of helping users to create trustworthy and resourceful associations ensuring a positive, purposeful interaction and learning process.

One evaluator commented that the application’s ability to suggest and display relevant videos is a useful feature to enhance the interaction levels between users and the materials within the application. The videos suggestion function allows the user to find more about the links provided. This feature therefore was seen to enable users to find a range of answers/techniques to solve a particular question. In fact, the freedom given to the users to personally organise materials is seen as another way to increase the interaction level between a user and a material. Another participant pointed out that what he liked about the application was the ability not only to run the content but also to organise the material (unlike like the publisher-and-reader style applications such as blogs where only the publisher can organise the material).
3.1.3 To discover how Virtual appreciation elements can motivate students to Collaborate.

The feedback also indicated that virtual appreciation highly motivates users to get involved in a collaborative team, leading to more interactions not only among the users but between users and the materials. For example kudos points would likely lead to a healthy competition if the users were ranked in a league within his/her fellow network members. This would allow learners to see their relative positions in the network and to understand how they might be able to improve his/her current position in a league. This sort of healthy competition and friendly rivalry might be able to encourage users to publish and share more information, as well as to get involved in many discussions. By doing these activities, they will collect more points so improve their current position in a league.

Additionally, the “like” and “dislike” buttons available to learners were also recognized as very useful features in online e-learning. All the participants reported that the use of these buttons encouraged them to share their videos with the community. For example if many users “liked” a video, it means the video’s content has good qualities and is acceptable. The “like” feedback encourages the uploading of more videos for sharing. It is likely that this kind of activity ensures that the learner is engaging with a community rather than just watching the videos suggested by others.

The feedback received also show that learners wanted to be recognised in a virtual learning community. One of the ways is through a distinctive user profile in the community. For example, in this application, as users contribute more content into the community, his/her “kudos points” would increase. In this case the researcher received a response from one of the participants to say how she liked the feature because the “kudos points” on her profile not only made her more confident in helping others but encouraged her to be more active, for example by replying to comments on the forum and uploading videos.

3.1.4 Evaluation whether the Application achieved its Goals or not

The overall analysis based on the responses received from the evaluators suggests strongly that the application has successfully achieved its goals. A social networking based e-learning environment was able successfully to increase interaction among the users in the virtual community and also increased the engagement level between users and the materials’ contents. The combinations of forum discussion and learning through video and audio made the learning process more interesting and fun. It was seen that this combination was beneficially blended together in an on online e-learning application rather than in a text based or only video based application.

The engagement level among users and materials increased when users were given the freedom and ability to organise the videos into their own personal folders. For example, the application allowed users to save videos into any folder of their choice (‘watch later folder’, ‘my document folder’, ‘saved video folder’ and ‘favourite folder’). We argue that learning through video and audio also is likely to enhance the learners’ engagement in a particular topic because it is often easier to understand a practical task with video than by text based, information alone.

The interactions among the users increased because they were able to see what the other learners had done in the past. Those activities were displayed on the user’s dashboard and they could persuade a user to follow what the others were doing by clicking the link history displayed on his/her dashboard. Interactions among users often occurred when users were discussing a particular topic and exchanging opinions with each other by posting their comments on the page.

From the feedback we learnt that participants enjoyed using the application because they had the ability to create quizzes and attach notes together with the videos uploaded by them. The evaluators commented that in this way learners are not only playing their role as a learner but also the role as a teacher. This we argue, motivated them not only to get involved in a learning community but in a virtual teaching and learning community.
We are able to view this application as an e-learning environment with the motivation to learn and teach, with deep collaboration and virtual appreciation from the other users in the community. Appreciation can be shown through the dislike and like buttons. User reputation can be shown through reputation points making the application e-learning process more fun and interesting. Displaying a user's position in a league within his network can create a healthy competition as users will tend to try to increase their reputation points through greater participation, such as uploading more informative videos, creating more topic discussion, helping others to answer questions, etc.

4.0 Discussion

The evaluation results and findings suggest that a social networking application such as developed here, has the potential to improve e-learning on the internet compared with purely text-based existing e-learning options. Such an application can increase the interaction levels both between different learners and also between a learner and the study materials. In fact, the authors found that allowing learners to revisit their tracks on the e-learning application is a feature particularly welcomed by the participants, being very helpful for information retrieval. According to Lamming and Newman (1991), "much information is hard to retrieve the need to do so was not foreseen at the time the information was stored". However, the user's "trail" can support the retrieval process because it contains a sequence of logical steps and pieces of information which can facilitate recall and memorisation. Hailpern et al. (n.d) in their article about improving recall with contextual searches stated that user's activity history acts as a "memory support" also because it contains pieces of information such as keywords and dates.

When a learner can retrieve the information previously studied, this is likely to make the learning process more interesting. One of the challenges in e-learning is how to help those learners with problems of information retention over time which may be hours, days or longer. Therefore a learner might choose to make use of the historicity elements in the application, knowing in a particular case that they can increase ease of learning and retention, and so also increase their motivation to learn (ETTAD, n.d). Therefore the historicity elements provide a promising enhancement in e-learning to assist learners who are having retention problems.

If a learner achieves his/her learning objective more easily, it seems likely that learning will be more interesting, fun and enjoyable, giving an increased incentive to learn. In e-learning, motivation could be influenced by means of several factors such as appreciation, intrinsic level of interest of the topic, and through competition among the learners. Based on the feedback gained during the evaluation process, showing appreciation (in this case through comments, "kudos points", like and dislike buttons) is an effective way to motivate learners. One of the participants pointed out that as he accumulated more "kudos points" from other learners, this visible expression of appreciation increased his enthusiasm and readiness to get involved in yet more discussion by helping others with answers, clarifications and comments regarding their postings. So incorporating means of expressing appreciation can create a virtuous circle motivating learning. Therefore, the authors suggest that integrating features that enable users to express their emotion is an important way to increase the incentive to learn.

Kudos points might also be used to create healthy competition among learners within a virtual community. Indeed if the points were depicted in the form of a league table, for many learners this could create a constructive sense of competition because they will strive to get more "kudos points" by participation in discussion or contributing and sharing materials with others. It is possible however that this competition might be counter-productive for some learners. We will investigate this issue in future research. This competition could potentially increase a learner’s participation and engagement, not only in a particular group discussion but in the whole community. By involvement with more groups there are likely to be more interactions, leading to a greater spectrum of views and diversity of opinions, leading to a richer “debate”. Diversity of expressed views may give students more alternative personal routes to understanding and learning and options to choose those which are the best for them. Therefore, this tally with an article entitled “diversity within unity” by Banks et al. (2001) the University of Washington, arguing that learning occurs when there is diversity in the environment.

In light of these findings, it will clearly be desirable to enhance the evaluation of the application by using a greater number of participants than the ten participants in this study. In conclusion, this study
strongly suggested that social networking has the potential to revolutionise the current e-learning approaches such as portal based e-learning, blogs, wikis and forum discussion. In fact, social networking technology has the potential to shift the learning process from “formal” to “informal” making learning a more relaxed, pleasurable and interactive process. This would allow students to schedule and plan a learning period so that their session is tailored for a specific time allocation. This is in accordance with one assumption related to the cognitive theory of multimedia learning which is due to the capacity of working memory; learners can only process a limited amount of information in each channel at one particular time (The eLearning coach, 2010). Other than that, the authors consider that the social networking approach allows learners to develop their knowledge for themselves as he or she learns in a constructivist way.

References


