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# Measuring Learners' Perceived Satisfaction Towards e-Learning Material and Environment

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*Abstract:* - The use of effective teaching materials either the materials are paper-based or computer-based, ensures that knowledge is transferred effectively and meaningfully to students. The materials can even be more effective if they are well-designed. One of the design methods that have the potential to produce effective learning materials is collaborative planning. Thus, this study implemented a collaborative planning in the development of an English literature component website, called e-Lit, as the teaching material for secondary education eventually evaluated its effect on students' satisfactions The website was assessed using a questionnaire consisting of six main dimensions. Analysis of this end-users' evaluation was used as the guidelines for the improvement of the actual website. Results of learners' perceived satisfactions showed that the students were not only satisfied with the course and design dimensions of the e-learning material, but also with the e-learning environment constructed from the use of this e-learning material. This suggest that involvement of the end-users was found to be beneficial for the development process of teaching and learning materials so as to increase the usability and quality of the materials developed which also satisfy the students as the end-users.

*Key-words*: teaching and learning materials, e-learning, English literature components, formative evaluation, perceived satisfaction.

## 1 Introduction

Collaborative planning in developing teaching materials is one of the methods to avoid doing work in isolation [1] as most teachers do. During the process of collaborative or shared planning, different views and perspectives can be gained from other teachers/experts in improving the teaching material. The process and products of teaching materials are important since the products are meant "…to be put into practice, tried out, revised, tried again, and revised again…" [2].

Programs developed would fail without the integration of a few aspects: policy development, sustainable professional development, curriculum integration, curriculum as well as close monitoring and evaluation [3].

Since the current trends of teaching and learning with web education is leading to a better learning environment, producing or developing any web-based teaching materials would also be more effective if the developer takes into account the intermediate processes involved before finalizing the products used [4]. Computer Assisted Language Learning (CALL) materials which are used in an ESL classroom could be a simulating tool as it can break "mundane monotony of classroom routine…" [5] However, the CALL material should go through certain stages to ensure it would function accordingly as expected by the users, in this context, the ESL learners [5]. One of the ways is through formative evaluation. This paper discusses the small scale study of an evaluation conducted on a prototype of the

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English literature component website which involved thirty two (n=32) end-users. This method is better known as the participatory design method that involves the end-users' participation prior, during and after the design and development phase.

## 2 Statement of the Problem

To facilitate the process of teaching and learning, the uses of suitable and relevant materials are undeniably important [2, 6]. The term teaching materials as "…any systematic description of the techniques and exercises to be used in classroom teaching"[6]. the teacher and his/her understanding of teaching materials can have great impact on the way thinking lessons are being performed. However, choosing the suitable materials that would fit the students' needs are not easy whereby teachers need to make necessary considerations before using them in the class [7]. One issue which emerges with regard in the use of teaching is whether the teacher needs to adapt or adopt the materials.

The term technology-based materials would always be associated with the use of computers. with the constantly up-and-coming new technologies, the field of education is not only being challenged to adapt but also "…being present with exciting opportunities…" and could break the mundane classroom routine practiced by the teachers [5, 8]. Today's education systems "…cannot keep out of the changes that new technologies bring up in our society and technological advances should generate a substantial transformation of our current didactical methodologies" [9].

English language literature components or the small *l*, is one of the aspects being integrated in the English language curriculum for the secondary school levels in Malaysia and it is currently being tested in the national level examinations. Malaysian Education Ministry hopes that the integration of the components would gradually change students' attitudes towards learning the language as well as upgrading their level of proficiency [10]. Despite the good intention, the teaching and learning of this component received negative feedback from the students as well as the teachers [10].

Although the ESL teachers have been given exposures via trainings in designing more inviting and engaging teaching and learning literature components, many still resort to using the conventional way – the chalk and talk approach. This is due to the exam-oriented culture practiced where teachers are constrained with completing the syllabus [10]. This scenario results in the genres listed in the literature textbook to be unappealing as they are repeated several times without variation and appealing graphics [11]. Since literature components in school are categorized as a "dry" subject, developing technology-based material has the potential in changing it to be more interesting. Thus, e-Lit, a web-based resource that consists of several technological features such as online notes, tests, as well as interactive discussions and games, was developed in order to enhance students' interest and motivation towards learning English language and literature components.

Fig. 1 shows the homepage of the developed e-learning material known as e-Lit Website. The website consist of the latest literature genres for Form Four Secondary Schools students. For the purpose of this study, the content for the genres were focused on two short stories and two poems. The contents in the website are arranged in order to display the concept of reading, testing and exploring online material; *Mini Library* – collection of notes provided using Web 2.0 applications; *Mini Lab* – tests and quizzes for the students to test their understanding towards these two genres;

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Fig 1: The Homepage of e-Lit website developed for the study

**Kopitiam Corner** is for the fun side of learning with videos and games related to the genres are provided; **Forum** for discussions; reference for further links to the other sources; **My Wall** section as the place for users to share their opinions on the issue listed and **About Me** as the section provided for the users to contact the author.

The processes of developing the materials are actually important since they are the parts where amendments and modifications for further improvement are made [1]. In the process of developing educational materials, there are usually two forms of evaluation methods involved: the formative and the summative evaluation. The formative evaluation is conducted during the development phase; it seeks to understand strengths and amplify them, and understand weaknesses and mend them, before the educational materials are deployed. This level of evaluation consists of planning which involved checking on the quality of the development process [12]. On the contrary, summative evaluation is where the designer and/or the developmental team members make judgment and document concrete evidence of accomplishment. These two evaluations stages are listed in the taxonomy of instructional design functions [12].

It is unfortunate to see that some instructional designers believed that formative evaluation as something that should be kept internal to a project, and not published. This is due in part to the belief that formative evaluations need not involve learners. "Development of any instructional media demands going through the following stages: (a) design, (b) production and (c) evaluation. In order to carry out these functions successfully it is important that persons with different professional backgrounds be involved as a team" [13]. Thus, the main objective of this study is to investigate students' perceived satisfactions towards the e-learning material based on the dimensions.

## 3 Research Framework

The framework for this small scale study of an action research evaluating an e-learning material is based on a study which looks at the learners' perceived satisfactions toward the material developed by the researcher[14]. Fig. 2 shows the framework used in this evaluation phase.
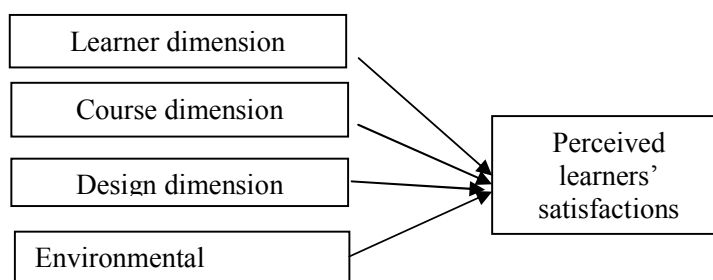
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Fig 2: the Dimensions measured for Learner' Perceived Satisfactions

## 3.1 Learner Dimension

According to Sun et al [14], "…learners' attitudes towards computers or IT is an important factor in e-learning…" and their attitudes are reflected from their "…impression of participating in e-learning activities through computer usage".

## 3.2 Course Dimension

The course flexibility in this context is focusing more on the flexibility, functionality as well as the interesting quality of the developed e-learning material. The flexibility aspects basically are channeled at the flexibility in time, choosing the learning content and tools to be used as well as flexibility in the approaches. In terms of functionality of the e-learning course, the focus is mainly on the functionality of the buttons, navigation, search engines, options, facilities to interact, giving comments as well as control towards the e-learning material. The other point of the course dimension is the quality of the material. Sun et al [14] considered this aspect as significant in determining learners' satisfaction towards the e-learning material.

## 3.3 Design Dimension

One of the vital variables in predicting learners' satisfactions in using e-learning material is the design. This aspect has also been highlighted by the technology acceptance model (TAM) that focuses on the degree of perceived usefulness and perceived ease of use. According to Sun et al [14], perceived usefulness is defined as "…perceptions of degrees of improvement in learning effects…" due to the adoption of the system; whereas perceived ease of use is more

on "…learners' perceptions of the ease of adopting an e-learning system".

## 3.4 Environmental Dimension

The four sub-elements investigated are: (i) learning community, (ii) motivation, (iii) sharing, and (iv) feedback. According to Thurmond et al. [15], this variable influences e-learning satisfaction significantly. The interactions that take place in the learning community, the feedback and sharing opportunities between learners with teachers, learners with materials as well as learners with learners shall eventually affect their satisfactions towards using the developed material.

# 4 Research Methodology

During this small scale study of an action research study, the survey method was employed in order to gather the learners' perceived satisfaction towards the e-learning product developed. A set of adapted evaluation form was used as the main instrument. The adaptations were based on several studies [16, 17,18]. The detailed items contain in the instrument used, are based on the respective dimensions and are as presented in Table 1.

Table 1: The detailed specifications of the items

| No | Dimension | Sub-construct |
|----|-----------|---------------|
| 1 | Learner | *Attitude toward IT |
| 2 | Course | *Flexibility<br>*Quality |
| 3 | Design | *Perceived usefulness<br>*Perceived ease of use |
| 4 | Environmental | *Diversity in interaction |

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The implementation of this e-learning product ends with an evaluation process which involved the participations of 32 Form Four students (secondary education) who were conveniently selected.  Early arrangements were made in terms of the administrations aspects involving the principal, the IT teacher as well as the English Language teacher in-charged of the class. The researcher met the respondents one week earlier in order to get their agreement to participate in the study.  The evaluation process was divided into two parts: (i) the familiarization part, and (ii) the evaluation part. The familiarization sessions involved with a briefing session  where the students were required to fill in the demographic form first before they were given the introduction to the e-learning material which is an English Literature Components website known as e-Lit. The students were asked to fill in the demographic form in order to gain some information regarding their personal details, details on the technologies owned and also their attitude towards IT.  The sessions took place at a school's computer lab and the respondents accessed the e-learning materials using the personal computers (PCs) in the lab. The respondents were divided into two groups: group A and B, 20 students per group.  The following table displays the schedule for the meetings.

Table 2: The Schedule for the Meetings

| Group | No of Meetings | Length |
|---|---|---|
| A | 5 times | 200 minutes |
| B | 5 times | 200 minutes |

The evaluation was done after the students had finished all the sessions as shown in Table 2.  In the evaluation part, the assessment was conducted on: (i)  the e-learning material; (ii) the e-learning environment. The data were processed using SPSS version 18.0 and analyzed descriptively. The reliability of each dimension included in the instrument was also established.

# 5 Findings of the Evaluations

Discussions on the findings of the formative evaluation were based on the four dimensions stated earlier.  The evaluation is based on the learners' perceived satisfactions towards the e-learning material developed by the researcher. Analysis for the reliability for each construct is in the range of 0.7 to 0.9. These values are considered acceptable for the study based on the values of Cronbach Alpha where values from 1-0.9 as very high; 0.7-0.89 as high; 0.3-0.69 as moderate and 0.00-0.3 as low [19].   Apart from that the minimum value for Cronbach Alpha should be equal to 0.6;  greater than 0.5 [20, 21].

## 5.1 Findings on Learner Dimension
The focus of this dimension is the learners' attitude toward IT. The data gathered for this aspect was based on the  demographic form given before the learners were introduced to the e-learning material. Initial analysis of the Alpha-Cronbach reliability of these six items was found to be 0.635. However based on the item total statistic, one item was deleted and this eventually increased the value of Cronbach Alpha to 0.783. Thus, this value is considered as acceptable.  This is as displayed in Table 3.

Table 3: Item-Total Statistics for Learner Dimension

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| c37 | 16.25 | 8.839 | .346 | .502 | .587 |
| c38 | 16.97 | 7.386 | .561 | .463 | .493 |
| c40 | 16.38 | 8.306 | .479 | .497 | .539 |
| c41 | 16.09 | 7.830 | .703 | .621 | .469 |
| c39 | 17.84 | 11.104 | -.122 | .225 | .783 |
| c42b | 16.00 | 8.065 | .460 | .380 | .541 |

The findings showed that these respondents exhibited positive attitudes   towards IT. From the data, 56% (n=18) respondents agreed that they spent little time with technology, 29% (n=9) often engaged in the use of technology outside the classroom, 56% (n=18) agreed that they sometimes used technology to support exploration in learning and 72% (N=23) agreed they use the technology  to get more information about Literature Components in English.

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## 5.2 Findings on Course Dimension

The other analysis was done based on the course dimension which was divided into three aspects: the flexibility, functionality as well as the interesting quality of the e-learning material. Based on the Cronbach Alpha, the reliability coefficients of the three aspects were 0.702, 0.892 and 0.924 respectively. Based on these values, the analysis was carried out on the related items. Each sub-construct under this course dimension has different number of items.

### 5.2.1 The Flexibility of the e-Learning Material.

There are 9 items which represent this construct. In terms of accessing to the notes anytime and anywhere, the level of satisfaction was found to be high; 81% (n=26) of the respondents reflected they were strongly satisfied, 19% (n=6) slightly satisfied and none showed dissatisfaction. Apart from that, they were also satisfied with the flexibility in getting connected with their peers at anytime and any place; 88% (n= 28) was very satisfied, 9% (n=3) a little satisfied and only 3% (n=1) was dissatisfied.

In terms of time limitations, flexibility to learn at any suitable time with differentiated learning styles and learning pace, the students were autonomous in deciding on what to learn, the tools to be used, as well as choice of the learning approaches. Fig. 3 displays the findings for the other aspects of flexibility which fulfilled their satisfaction.
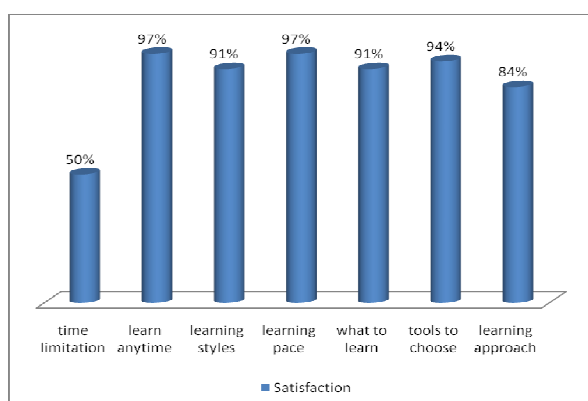


Fig. 3: Satisfaction towards the flexibility of the e-learning material

### 5.2.2. Functionality

The aspect being focused for this sub-construct is how well the e-learning material works. In order to evaluate the functionality, there are 20 items being listed in the evaluation form. The reliability of the items was found to be 0.892 and this value is considered high and the items are suitable for the construct being looked into [22].

The items in this section, focus mainly on the functionality of the buttons, navigation, search engines, options, facilities to interact, giving comments as well as control towards the e-learning material. The analysis shows that majority of the students displayed high level of agreement that they function according to expectations. For evaluation on the functionality of the buttons, 77% agreed and were satisfied with it. In terms of functionality of the options provided, facilities, and navigation, 74 % were satisfied with the functionality provided, 79% were satisfied with the facilities and 76.34% agreed that their navigation on the website function as expected.

### 5.2.3 The Interesting Quality

There are 21 items that focus on the interesting quality of the e-learning material. The analysis on reliability of the construct showed high value where the Cronbach Alpha was found to be 0.924. The following charts are the feedback given by the students in evaluating the interesting quality of the website.
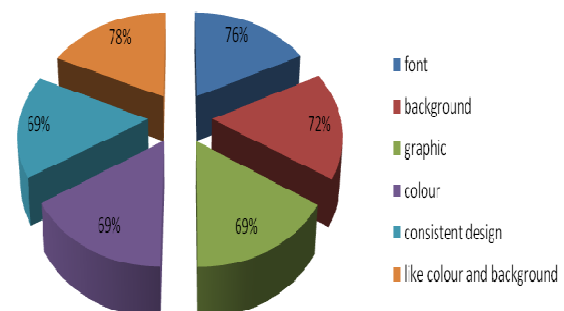


Fig. 4: The evaluation on the interesting quality of the e-learning material

Fig. 4 displays the findings of the quality of the fonts, background, graphic, colors, design as

well as preference towards the colors and background. More than 65% of them responded that they were satisfied with the quality of the aspects listed. From the figure, it can be seen that 78% (n=24) were satisfied with the fonts used in the website, 72% (n=23) were satisfied with the background and equal percentage of 69% (n=22) of them were satisfied with the graphic, colors as well as design of the website. There was one item which required the respondents to indicate their preference towards the colors and background used on the website. The outcome showed that 78% (n=24) of them like the colors as well as the background used on the website.
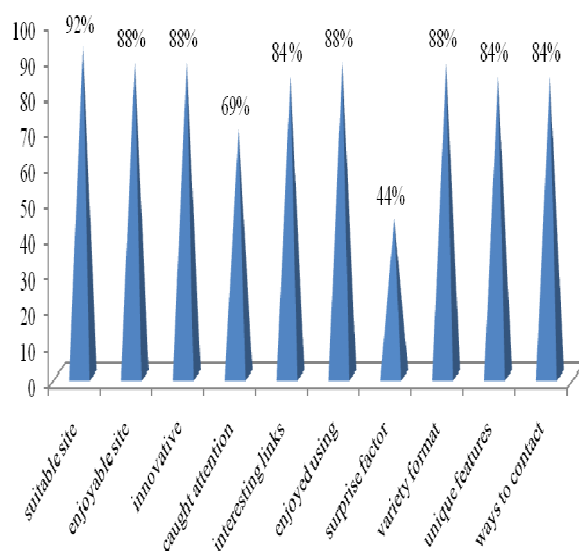


Fig. 5: The evaluation on the interesting quality of the e-learning material

Fig. 5 displays the other ten items in evaluating the interesting quality of the e-learning material known as e-Lit. The end results showed that majority of the respondents were satisfied with the interesting quality of the web site. The indication of their satisfaction could be seen when 92% (n=30) of them rated a suitable site for them, 88% (n=28) of them rated the website respectively is an enjoyable site and innovative, 69% (n= 22) agreed that the site caught their attention and 84% (n=27) agreed that they found the links on the website as interesting. The findings from the raw data also showed that 88% of the learners enjoyed surfing the website related to the genres learned in the literature components, 84%(n=27) agreed that

there are variety of formats presented on the website, 84% (n=27) agreed with the unique features found on the web and 84% (n=27) agreed that there were ways to contact the author.

Despite of the high percentages of the interesting aspects shown, there is one factor which got quite low percentage; the surprise factor. With only 44% (n=14) of the respondents evaluated the website consisted of surprise factor, this aspect will be given attention in the next level of improvement processes with the other developmental team members.
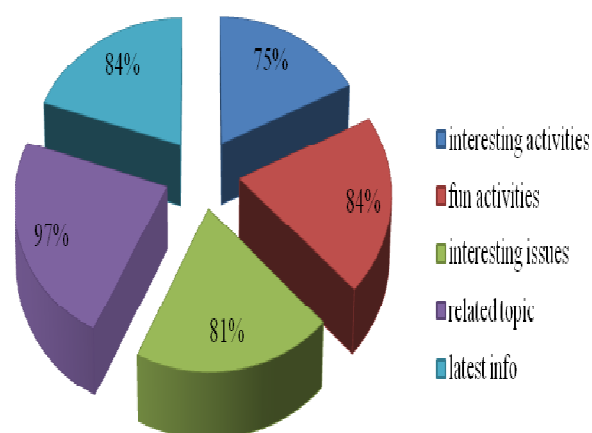


Fig. 6: The evaluation on the interesting quality of the e-learning material

The results for the other five items in evaluating students' satisfaction towards the interesting quality of the e-learning material are as presented in Fig. 6. These five items focused on the quality of the activities provided on the website. The outcomes of the analysis showed high percentages to indicate students' satisfactions. In terms of the activities, 84% (n=27) evaluated them as interesting and fun; whereas 81% rated the issues posted in the website as interesting, 97% (n=31) agreed that the topics were related to the genres learned in literature components and 84% (n=27) agreed that the information is the latest according to literature components syllabus.

## 5.3 Findings on Design Dimension
The evaluation of the design dimension focuses more on the learners' perceived

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usefulness as well as perceived ease of use toward the learning material. Similar process was taken by the researcher where the reliability of the items was first checked. The values of Cronbach Alpha for these two sub-dimensions were 0.962 for perceived usefulness and 0.912 for perceived ease of use. Since the values are high, no item was deleted.

### 5.3.1 Perceived usefulness

Based on the analysis of 5 items under this dimension, the value of Cronbach Alpha was 0.948. The raw data showed that the respondents perceived the e-learning material as useful. With respect to "strongly agree" and "agree" responses, 91% (n=9) of the respondents felt that the "information presented", "options", "links" and "tool" were useful, while 94% (n=30) of them viewed that the material was useful for "students' learning of literature**.** These figures were higher compared with the figures who disagreed with the usefulness of the e-learning material being evaluated.

### 5.3.2 Perceived ease of use

There are 8 items analyzed for this dimension which has high reliability with the value of 0.912. The criteria of content display, navigation, instructions and language used are the main focus in evaluating the ease of use of this e-learning material. The response rates for the items in this dimension were high for "strongly agree" and "agree".

The results showed a total of 84% (n=27) of the respondents rated the display of content as easy, 88% (n=28) agreed that the content was neatly arranged, 91% (n=29) rated the main path to navigate was easy, 78%(n=25) agreed the options made their navigation easy whereas another 81% (n=26) also agreed that the instructions were easy. In measuring their satisfaction towards the information in the website, 72% (n=23) agreed that it was easy to understand. However, as for the language used in this e-learning material, only 66% (n=21) of the respondents agreed it was easy and 78% (n=25) claimed that it was an easy site to be used to learn English Literature Components.

## 5.4 Findings on Environmental Dimension

The other aspect of dimension evaluated in this pilot study was the environmental dimension. The researcher has categorized four sub-elements which are (i) the learning community, (ii) motivation, (iii) sharing and (iv) feedback.

### 5.4.1 Learning Community

Results for the learning community were gathered from 5 items which has Cronbach Alpha value of 0.725. Learning environment created for them in this research was aimed to lead the students to have their learning community. A total of 91 % (n=29) agreed they had more opportunities to interact, 81% (26) agreed they were able to communicate in between face-to-face lesson, and 75% (n=24) agreed they were free to chat with their peers. Apart from that, 88% (n=28) these respondents also indicated that they had more facilities for communications and 75% (n= 24) agreed they were able to communicate with other students from the other group through the use of this e-learning material.

### 5.4.2 Motivation

The findings of the motivational aspect after using the website were found to be high. These students claimed they enjoyed the fun of learning (91%), the variety of approaches increased their interest to study (100%), felt comfortable (94%), satisfied with the learning environment (84%) and the SMS they received made them felt motivated to learn (94%). Fig. 7 exhibits the analysis of the data for this dimension.
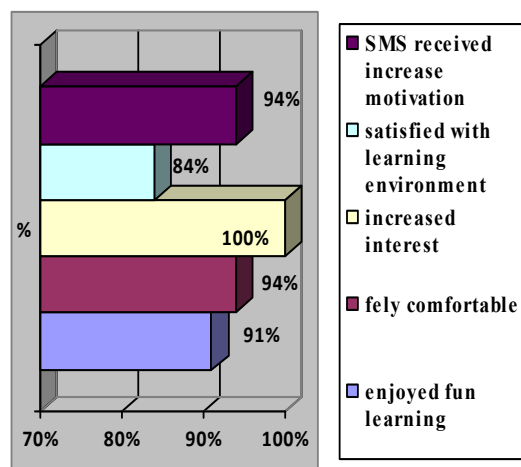
Fig 7: Results of the Motivational Dimension

### 5.4.3 Sharing Opportunities

Another aspect being evaluated is "the sharing opportunities in learning". Students were able to share not only the materials but their thoughts as well. A total of 84% (n=27) of the respondents agreed they were able to share materials, 91% (n=29) agreed they were able to share opinions, 75% (n=24) was able to share problems, 91% (n=29) was able to share experience and finally 88% (n=28) was able to share knowledge with their peers from the activities provided in the e-learning material.

### 5.4.4. Feedback

Apart from the three sub-dimensions above, the evaluation also focused on the students' feedback given when they used this website. There are 5 items which measure the feedback aspect of the material. The respondents reflected high level of agreement where 27 of them (84%) agreed they did not have to wait for the face-to-face meeting to get feedback, 29 (91%) agreed they were able to check their record status and 24 of them (75%) agreed and satisfied they obtained feedback for the skills mastered. In addition to those findings, 29 of the respondents (91%) agreed that their involvement could be checked and 27 of them (88%) agreed they obtained quick feedback from the facilitator.

## 6  Discussion

an alternative to conventional face-to-face education is through the use of online e-learning [14]. Although  only descriptive measures were presented, the findings still provide some useful insights for the aspects that need to be focused on when creating any e-learning material. Based on the study's empirical findings, it can be concluded that majority of the respondents were satisfied with the use and quality of the e-learning material developed for the study. Their satisfaction will indicate in the future whether they are going to continually use the material as their learning tool [14].

One of the reasons for the satisfaction was because these students have positive attitudes towards the use of technology in general. Learning using computers and Internet mean that it is a combination of learning about them and learning with them [23]. When students have positive attitudes towards technology, most probably this would lead to successful computer learning and this factor is important in determining learners' satisfaction in using the material [14, 24].

It is important to note that today's generation, who are born together with technology, would want something more interesting rather than the conventional  process of learning using chalk and talk [25]. educators who should know and aware that learning occurs beyond the four walls of the  classroom and the development of a quality website can enrich all student's learning opportunities by providing helpful resources not only for them but to others such as parents [24]. In order to break  the mundane process of teaching and learning, it is vital and in fact appropriate for educators to engage learning with the  emerging technologies because they view that in today's era, the notion "…engagement with learning is likely to mean engagement with technology" [26]. Involving users in the process of evaluating the learning material which is important because they "…may play a role in the development of web pages, acting as 'curators'...of good pages" [24]. eight conditions for learning in a virtual world and they are as found in Table 4 [27].

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Table 4: Conditions for Learning Virtually by Driscoll

| No | Conditions |
|---|---|
| 1 | Learning is embedded in a fully realized, complex, interactive 3D environment that offers environmental controls (sun, wind, rain) without narrative. |
| 2 | Learners interact through avatars, which can use facial expressions, perform gestures, change their appearance, fly and interact with avatars using text chat, IM and ( with additional software) audio. |
| 3 | Learners work in groups to complete activities, exploring and negotiating as a group to complete these activities and reflecting on their practice as work in progress. |
| 4 | By encouraging groups to operate a problem based approach (PBL) and investigate possible solutions to a learning question, learners are given the opportunity to test and compare multiple perspectives and, especially when several groups work on the same problem, to become aware of multiple modes of representation (e.g different ways of representing a system map) which further encourages ownership in learning. |
| 5 | Activities are proactive and collaborative but time can be flexible to allow learners sufficient time to investigate a problem and explore in depth as appropriate within the environment to test their developing knowledge |
| 6 | Learning activities are designed so that learners are proactive and engaged in the learning process but also encouraged to reflect on their learning pathway and the learning process underway. |
| 7 | Knowledge needs to be presented in an authentic context, i.e. settings and applications that would normally involve that knowledge. |
| 8 | Learning activities (e.g. simulations or design/construction activities) are constructed that match real world activities/behaviors/actions and events as closely as possible. |

In addition, the respondents were also motivated to use the website as their learning tool. ICT can help make the teaching and learning process turn out to be more engaging and active. This signifies that the use of ICT as tools has the potential to expand access to education, strengthen the relevance of education, and also raise the quality of education [23,24,26].

In the case of e-learning material evaluation, , there are three main areas to focus on: the content, the overall structure and accessibility to all [24]. Besides, it is also good if the evaluation can be conducted regularly so as to ensure the accuracy of the material, up-to-date information is provided to the users, and students' attitudes are taken into consideration [24,28]. Furthermore, the aspects of design, structure, content and general issues of any website or e-learning materials can be performed through the use of a checklist [1]. Thus, in order to improvise the aspects which did not meet the respondents' preference, the results were then presented to the developmental team which consisted of a few experience teachers in the subject matter.

## 7 Conclusion

It is very true that developing any teaching materials should not be an isolated and individual process [6,29]. Collaborative work involving the end-users should be done. This would benefit not only the developer of the materials but also the end-users. The process of revising as well as trying out the initial prototype of the curriculum product being developed is vital before coming out with the final product [1, 6, 30]. "…the ability to engage in collaborative work is a hallmark of online and the foundation of a learning community"[6].

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