7 Attractive Factors for E-learners

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ABSTRACT: *Educational psychologists assert that a learner's motivation initiates his behavior and persistence in learning activities (Woolfolk, 2007; Stipek, 1998). His motivation may have influenced his efforts and as these efforts prove successful, his sense of self-efficacy increases, and in turn, improves motivation (Elliot et al., 2000). Most studies claim that students have positive attitudes toward e-learning (Todman & Dick, 1993; Intratat, 2007). However, some intrinsic personal factors such as gender and age affect the success levels of the e-learners. Further, extrinsic environmental factors such as technical problems, pressure of work and lack of time have an impact on students' withdrawal levels from e-learning programmes (Packam, et al., 2004). In order to investigate the attractive factors that encourage e-learners to develop as autonomous learners, this study surveyed the opinions of university students who had experienced studying with e-materials. The subjects in the study were 3,080 undergraduates and graduate students from all nine faculties at the King Mongkut's University of Technology Thonburi (KMUTT). The study focused on the students' reasons for using the computer and the e-materials which they did frequently. The major findings indicate that they used computers mostly to communicate with friends, and to search for general and academic information. The most frequently visited websites were described as user-friendly, equipped with up-to-date general knowledge and academic information and were directly related to the students' reports or homework.*

Introduction

Developers of e-materials such as computer assisted language learning (CALL) and educational web designers share a similar goal with language teachers that their learners will study or practice successfully throughout the learning process. In the event that the target groups have not accomplished their learning tasks, the developers and designers expect that their materials will serve the practical needs of the learners. They hope that their materials will encourage the learners to persist despite their difficulties and continue to study regularly. Most of all, it would be ideal if the learners could manage a self-directed performance, because this would develop an autonomous learning mindset suitable for life-long study. In order to achieve this goal, it is essential for developers and designers to find not only interesting content but also techniques to create attractive, stimulating, and encouraging materials.

However, attracting and preserving the learners' interest in study is difficult because learners will not perform self-directed and self-regulated e-learning unless they are motivated. Many educational psychologists also accept that a learner's motivation positively influences his behavior and enhances his persistence in learning activities (Woolfolk, 2007; Stipek, 1998).

Generally, motivation is classified into two types—intrinsic and extrinsic. Intrinsic motivation is influenced by personal factors such as the need to conquer, their interests, curiosity, beliefs, expectation, enjoyment, self-esteem, self-fulfillment, and self-determination. On the other hand, extrinsic motivation is influenced by external environmental factors such as rewards, social

pressure, punishment, maintaining identity, and group acceptance. When a learner works to fulfill his personal interest, he is inspired by intrinsic motivation (Deci & Ryan, 2002). In addition, his motivation may have influenced his efforts and as these efforts prove successful, his sense of self-efficacy increases, and this in turn, improves his motivation (Elliott et al., 2000).

This viewpoint purports that a learner's habit of learning autonomously is directly supported by his intrinsic motivation. When the learner has self-esteem and self-confidence in his achievement, he develops strong interest in his work with greater persistence and effort (Marsh, 2004).

Intrinsic motivation is also inspired by the learner's creativity, flexibility, and ego needs to be competent and to exercise personal control. A number of educational psychologists suggested general principles for a motivating material: it should provide immediate feedback (Hudson, 1984) and it should be interesting and enjoyable (Elliott, 2000). The material should also provide challenging and varied learning activities to maintain interest (Marsh, 2004) and should enable the student to aim for achievable short-term goals (Marsh, 2004; Woolfolk, 2007). In addition, the requirement for the output in the tasks should be clear and new techniques and methods such as simulations and games should be used to arouse the learner's curiosity. However, familiar background knowledge of the learner is needed as a stepping stone (Marsh, 2004). For this reason the material should be comparable to real world situations in which the learners can exercise their choice of action and control of effect. Such active involvement creates positive emotions which will facilitate learning and performance (McCombs, 2007).

Several studies also indicate that the use of e-materials such as CALL is a way to improve foreign language teaching and learning. Most studies agree that students have positive attitudes toward e-learning (Todman & Dick, 1993; Intratat, 2007). This supports the principles for motivating materials because e-materials are current and engaging and they arouse the learner's curiosity and excitement. Moreover, they are designed to help the learners privately and automatically. Since e-materials usually provide the answers after the learners commit a few wrong attempts, they reduce the learners' embarrassment and anxiety (Elliott, 2000).

The studies referred to above claim that e-materials should be the most appropriate tool for modern learners. However, some intrinsic personal factors such as sex and age affect the success level of e-learners and extrinsic environmental factors such as technical problems, pressure of work and lack of time result in students' withdrawal levels from e-learning programs (Packham et al., 2004). It is therefore significant to investigate the factors that render e-materials effective in encouraging learners to keep on studying with them.

Purpose of the study

This study surveyed the opinions of KMUTT students who had experiences in studying with e-materials. The purposes of the study are as follows:

- To find out the students' purposes when using computers, the contents of e-materials and the reasons for their frequent visits to preferred websites.
- To explore the factors that might encourage e-learners to develop as autonomous learners.

Research method

The subjects, instruments and data analysis used in this study are as follows.

- The subjects in the study were 3,080 undergraduate and graduate students enrolled in the first semester of 2008. There were 2,715 undergraduate students and 365 graduate students representing approximately 25% and 5.8% respectively of the undergraduate and graduate population from all nine faculties at King Mongkut's University of Technology Thonburi (KMUTT), Bangkok, Thailand.
- The instrument used in the study was a set of questionnaires, distributed by selected sampling. It consisted of questions with Likert scale answers and some open-ended questions for additional suggestions or comments.

The questions in the first part probed the students' purposes when using computers such as when communicating with friends, searching for general or academic information, entertaining themselves, practicing skills on their own or those assigned by teachers as well as when engaging in hobbies or part-time jobs. The questions in the second part were concerned about the content of academic websites that the students regularly visited. Certain characteristics were listed such as content that may be examined, general up-to-date information, exercises with key answers, illustrations and games, information for reports or homework, suitable vocabulary or a Thai translation facility, and a user-friendly layout.

The questions in the third part sought the reasons for students' frequent visits to their favourite websites. The choices of reasons included being able to study at a convenient time and place, to use their free time constructively, to practice skills and to gain new knowledge. Preferring to study with e-materials, and following suggestions from lecturers and recommendations from peers or seniors were also provided as choices.

- The data collected were analyzed for means and SD. The difference between groups was analyzed by t-test and one-way ANOVA for statistical significance. The results of students' opinions were interpreted, applying the ranking by Best (1981) as follows:

  1.00–1.70 = the least
  1.80–2.50 = less
  2.60–3.30 = moderate
  3.40–4.10 = much
  4.20–5.00 = the most

Findings

The students' purposes of using computers

On the whole, all the students' purposes could be interpreted as moderately popular ($\bar{x}$ = 3.30, *SD* = 1.0802). The purpose to use computers to search for general information of their interest ($\bar{x}$ = 3.92) was rated the highest. The next most popular purposes were contacting friends via e-mail or Hi-Five ($\bar{x}$ = 3.76) and searching information for reports or homework. Entertainment such as playing computer games was the students' fourth most popular purpose ($\bar{x}$ = 3.50). Studying or practicing as assigned by teachers ($\bar{x}$ = 3.00) and self- studying ($\bar{x}$ = 3.01) were moderately popular and engaging with hobbies and part-time jobs ($\bar{x}$ = 2.22) were less popular. The details are in Table 1 below.

The comparison of the purposes distinguished by gender revealed that, in general, the male and female students did not rate all purposes as significantly different. On the contrary, when comparing purposes by levels of study and faculties, there was significant difference at 0.05 levels.

Table 1: Students' purposes for using computers

Purpose	Mean	SD	Opinion ranking
Searching for general information	3.92	0.8945	much
Contact friends: e-mail, hi5, etc.	3.76	1.1258	much
Searching for reports or homework	3.67	0.9845	much
Engaging in entertainment	3.50	1.2123	much
Self- studying	3.01	1.0441	moderate
Studying/practicing as assigned	3.00	1.0006	moderate
Engaging in hobby or part-time job	2.22	1.2538	less
Average	**3.30**	**1.0802**	**moderate**

In comparing purposes by levels of studying, there was overall significant difference at 0.05 levels. When each topic was analyzed, it was found that first year students and fourth year students used computers for contacting friends more than other students ($\bar{x}$ = 3.82). Graduate students used computers when searching for general information ($\bar{x}$ = 4.0), for searching academic information for reports or homework ($\bar{x}$ = 3.83), and for studying or practicing as assigned by teachers ($\bar{x}$ = 3.12) more than other students. First year students used computers for entertainment more than other students ($\bar{x}$ = 3.63). Meanwhile, the second and third year students used computers for self-studying more than other students ($\bar{x}$ = 3.11 and 3.12 respectively). The second year and the fourth year students used computers for hobbies or part-time job more than other students ($\bar{x}$ = 2.42). The details are shown in Table 2.

As for the purpose of contacting friends, students from the School of Architecture and Design, and Graduate School ($\bar{x}$ = 3.89) used computers more than students from other faculties. Students from the School of Bio-resource and Technology used computers to search for information of their interest and for reports or homework more than other students ($\bar{x}$ = 4.36). As for entertainment, the students from Graduate School, Faculty of Industrial Education and Technology used computers for entertainment more than other students ($\bar{x}$ = 3.68).

For the purpose of studying and practice assigned by teachers, students from the School of Energy and Material used computers far more than other students ($\bar{x}$ = 3.38). For self-studying purposes, students from the School of Liberal Arts used computers more than other students ($\bar{x}$ = 3.40).

Regarding hobbies and part-time jobs, the students from the Faculty of Industrial Education and Technology used computers for more than other students ($\bar{x}$ = 2.64). The details are presented in Table 3.

In answering the open-ended questions, the students provided additional purposes of using computers. These included gathering information by watching the news and movies, listening to songs, reading horoscopes or religious stories, and buying goods. Some academic purposes given included reading journals, upgrading new technology, loading illustrations for reports and printing work.

Characteristics of academic websites that students frequently visited

Overall, the most popular characteristic of academic websites was its user-friendliness whereby the information could be conveniently searched ($\bar{x}$ = 3.96). Other popular characteristics were the content that included new general knowledge ($\bar{x}$ = 3.80), information for projects or homework ($\bar{x}$ = 3.74) and descriptions with suitable vocabulary or with a Thai explanation ($\bar{x}$ = 3.58). Illustrations and games ($\bar{x}$ = 3.52), and content that could be examined ($\bar{x}$ = 3.50) were also rated as popular features, and content with exercises and answers ($\bar{x}$ = 3.38) were rated as moderately popular.

The result of the analysis showed that in general, male students and female students had significantly different opinions at the levels of 0.05 regarding the characteristics of the websites that they frequently visited. The female students preferred content that could be examined more than male students. They also chose the following characteristics more than male students: contents that included exercises with answers, information for projects or homework, descriptions with suitable vocabulary or with Thai explanation. Moreover, they preferred websites that were conveniently located such that they could search for information easily. The details are shown in Table 4.

The researcher then compared characteristics of academic websites among students from different academic levels of study. Overall, there was no significant difference at the levels of 0.05. However, students from different faculties had significantly different preferences for the characteristics of academic websites that they frequently visited. Students from the Institute of Field Robotic (FIBO) looked for contents that could be examined ($\bar{x}$ = 4.0), exercises with answers ($\bar{x}$ = 4.14), and illustrations and games ($\bar{x}$ = 4.14) more than other students. Students

Table 2: Purposes to use computers by levels of studying

Purposes to use computers years of studying		Contact friends	Searching general information	Searching information for report or homework	Entertainment	Studying/ practicing as assigned	Self-studying	Hobby/ part-time job	Total
Undergraduate 1st year	Mean	3.82	3.90	3.52	3.63	2.84	2.83	1.99	3.22
	SD	1.1418	0.9181	1.0005	1.2425	0.9514	1.0089	1.2104	0.6054
Undergraduate 2nd year	Mean	3.71	3.89	3.72	3.53	3.10	3.11	2.42	3.36
	SD	1.1396	0.8890	0.9574	1.1480	1.0031	1.0052	1.2571	0.5981
Undergraduate 3rd year	Mean	3.69	3.93	3.67	3.44	2.98	3.12	2.22	3.29
	SD	1.1477	0.9011	1.0261	1.2336	1.0115	1.0731	1.2914	0.6183
Undergraduate 4th year	Mean	3.82	3.98	3.80	3.35	3.04	3.09	2.42	3.36
	SD	1.1202	0.8873	0.9570	1.2061	1.0345	1.1312	1.3121	0.6252
Graduate	Mean	3.75	4.01	3.83	3.15	3.12	3.07	2.16	3.30
	SD	1.0074	0.8295	0.9482	1.2246	1.0510	1.1123	1.1795	0.5626
F		1.8853	1.7960	10.5115	11.9417	11.1928	11.9495	18.1225	7.6918
Sig.		0.1102	0.1268	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 3: Purposes to use computers by faculties

Purposes to use computers by faculties		Contact friends	Searching general information	Searching information for report or homework	Entertainment	Studying/ practicing as assigned	Self-studying	Hobby/ part-time job	Total
Engineering	Mean	3.79	3.88	3.59	3.58	2.91	2.92	2.09	3.25
	SD	1.0960	0.8909	0.9694	1.1852	0.9735	1.0227	1.2120	0.5853
Science	Mean	3.80	4.01	3.76	3.31	2.97	2.91	2.05	3.26
	SD	1.1993	0.8726	1.0303	1.3130	0.9884	1.0289	1.2729	0.6282
Industrial Education and Technology	Mean	3.77	3.90	3.70	3.68	3.23	3.26	2.64	3.45
	SD	1.1103	0.8517	0.9647	1.1123	1.0124	1.0130	1.2685	0.6226
Information Technology	Mean	3.33	3.66	3.51	3.33	3.26	3.32	2.56	3.29
	SD	1.2819	1.1382	1.0352	1.1987	0.9282	1.0032	1.2476	0.5959
Architecture and Design	Mean	3.89	4.18	3.87	3.19	2.89	3.01	2.20	3.31
	SD	1.0235	0.7751	0.9827	1.3118	1.0899	1.1411	1.2942	0.6214
Bio-resource and Technology	Mean	3.86	4.41	4.36	2.68	2.59	2.86	1.59	3.19
	SD	1.2458	0.7341	0.7895	1.4924	1.1406	1.2069	0.9081	0.5791
Energy and Material	Mean	3.74	4.09	3.76	3.26	3.38	3.18	1.82	3.32
	SD	0.9942	0.7121	0.8187	1.2138	0.9539	0.9991	1.0290	0.5693
Liberal Arts	Mean	3.00	3.80	4.00	2.80	2.60	3.40	1.00	2.94
	SD	1.2247	0.4472	0.7071	0.8367	0.5477	0.5477	0.0000	0.2595
Graduate School	Mean	3.89	4.05	3.89	3.68	2.54	2.34	2.07	3.21
	SD	0.6790	0.5533	0.8459	0.9363	0.9138	0.9200	0.8498	0.4401
FIBO	Mean	3.86	3.71	3.86	3.17	2.00	1.71	1.57	2.88
	SD	0.8997	0.4880	0.6901	0.7528	0.5774	0.4880	0.5345	0.4372
F		5.0383	6.5372	4.9417	7.3430	10.3989	12.0808	14.0828	5.0383
Sig.		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 4: Characteristics of frequently visited academic websites

Characteristics of frequently visited academic websites		Content of exam	New general knowledge	Exercise + answer	Illustration + game	Information for report, homework	Simple vocabulary, Thai	Convenience	Total
Male students	Mean	3.45	3.77	3.34	3.50	3.64	3.52	3.89	3.59
	SD	1.0034	0.9171	1.0377	1.0348	0.9478	0.9972	0.9651	0.6506
Female students	Mean	3.55	3.82	3.43	3.53	3.83	3.63	4.03	3.69
	SD	1.0029	0.8795	1.0237	1.0147	0.9314	0.9813	0.9134	0.6591
t		-2.6433	-1.4099	-2.4674	-0.7272	-5.6299	-3.0324	-4.1595	-4.2302
Sig.		0.0083	0.1587	0.0137	0.4672	0.0000	0.0024	0.0000	0.0000

from the School of Energy and Material searched for contents with new general knowledge ($\bar{x}$ = 4.29) and descriptions with suitable vocabulary or with Thai explanation ($\bar{x}$ = 3.88) more than other students. Meanwhile, students from the School of Liberal Arts preferred websites that were convenient for searching information ($\bar{x}$ = 4.20) more than other students. The details are shown in Table 5.

With regard to the open-ended questions, some remarks from the students show that they frequently visited websites hosted by universities, faculties and academic journals. Thus, user-friendliness is also an important consideration.

Reasons why the students frequently visited the academic websites on their own

This section explores the reasons that inspired these students to return and study or practice at the same websites repeatedly. Overall, the most popular reasons include being able to study at a convenient place ($\bar{x}$ = 3.78) and time ($\bar{x}$ = 3.74), being able to use their free time constructively ($\bar{x}$ = 3.50), practice skills and get new knowledge ($\bar{x}$ = 3.46). Other reasons rated as moderately popular were having a preference to study with e-materials ($\bar{x}$ = 3.28), following suggestions from lecturers ($\bar{x}$ = 3.21), and recommendations from peers or seniors ($\bar{x}$ = 3.03).

In general, the reasons of male and female students were not significantly different at the 0.05 levels. In comparing the reasons among students from different levels of study, there was no significant difference but the reasons among students from different faculties were significantly different at 0.05 levels.

The students from FIBO frequently visited the academic websites due to the convenience of studying anytime ($\bar{x}$ = 4.00) and the recommendation by peers or seniors ($\bar{x}$ = 3.71), whereas students from the School of Liberal Arts did so because it allowed them to study regardless of location ($\bar{x}$ = 4.20). Students from the Faculty of Science visited the websites that were suggested by their teachers ($\bar{x}$ = 3.43), and the students from the Faculty of Industrial Education and Technology liked to study with e-materials. The students from the School of Energy and Material visited academic websites because they wanted to use their free-time constructively ($\bar{x}$ = 3.76), and to practice skills and obtain new knowledge ($\bar{x}$ = 3.91). The details are presented in Table 6.

Also, in answering the open-ended questions, students added more reasons for repeated visits to the same academic websites on their own. They were related to the quality of the websites in terms of their entertainment factors, interest level, suitability to individual needs, practicality, and their loading speeds.

Discussion

According to the study, it can be seen that the students used computers for academic purposes, social contact and entertainment more than for hobbies or part-time jobs. Overall, there was no significant difference between male and female students' purposes when using computers. However, by the different levels and fields of study, their purposes were significantly different at 0.05 levels.

User-friendliness was the most preferred characteristic of the content in academic websites that students regularly visited on their own. The characteristics were significantly different by gender and fields of study but not levels of study. Students frequently visited the academic websites mainly due to the convenience afforded them in terms of the time and place of study. In general, the factors of sex and academic levels of study did not affect the students' choices. The students' reasons in visiting the websites were significantly different at the 0.05 levels by their fields of study.

These findings revealed that intrinsic factors such as gender, levels of study or ages, as well as extrinsic factors such as fields of study affect the students' purposes, preference and persistence in e-learning. These findings are **consistent** with the study of Packham, Jones, Miller, and Thomas (2004).

Table 5: Characteristics of frequently visited academic websites by faculties

Characteristics of frequently visited academic websites by faculties		Content of exam	New general knowledge	Exercise + answer	Illustration + game	Information for report, homework	Simple vocabulary, Thai	Convenience	Total
Engineering	Mean	3.50	3.80	3.41	3.52	3.73	3.55	3.92	3.63
	SD	0.9849	0.9009	1.0095	1.0305	0.9282	0.9819	0.9568	0.6481
Science	Mean	3.61	3.86	3.56	3.55	3.79	3.72	4.08	3.74
	SD	0.9810	0.9021	1.0340	1.0314	0.9805	0.9935	0.9306	0.6904
Industrial Education and Technology	Mean	3.49	3.78	3.43	3.64	3.72	3.59	3.92	3.65
	SD	0.9338	0.8615	0.9480	0.9303	0.8933	0.9397	0.8951	0.6194
Information Technology	Mean	3.44	3.65	3.37	3.40	3.63	3.61	3.92	3.58
	SD	1.0786	0.9252	1.0186	0.9711	1.0428	0.9513	0.9768	0.6666
Architecture and Design	Mean	3.33	3.82	2.76	3.31	3.78	3.37	4.17	3.51
	SD	1.2261	0.9809	1.1693	1.2053	1.0499	1.1894	0.9349	0.7321
Bio-resource and Technology	Mean	3.00	3.91	2.73	3.09	4.24	3.55	4.14	3.56
	SD	1.1547	0.8679	1.1205	1.2690	0.8309	0.9117	0.5732	0.5843
Energy and Material	Mean	3.59	4.29	3.62	3.47	4.00	3.88	3.94	3.83
	SD	0.9883	0.7190	0.9216	0.9288	0.8165	0.8796	0.9516	0.4958
Liberal Arts	Mean	2.40	4.00	2.80	3.40	4.20	2.60	4.20	3.37
	SD	0.8944	0.7071	0.8367	0.5477	0.4472	0.5477	0.8367	0.2390
Graduate School	Mean	3.66	3.71	3.57	3.57	3.70	3.58	3.79	3.70
	SD	0.7205	0.7315	0.7594	0.9882	0.7115	0.8320	0.9670	0.5688
FIBO	Mean	4.00	4.14	4.14	4.14	3.57	3.57	4.00	3.94
	SD	0.0000	0.3780	0.6901	0.3780	0.5345	0.5345	0.5774	0.2590
F		3.2088	2.4804	13.6270	3.0938	1.7550	3.3693	2.9176	3.1711
Sig.		0.0007	0.0081	0.0000	0.0010	0.0718	0.0004	0.0019	0.0008

Table 6: Reasons to visit the academic websites on their own by faculties

Reasons		Convenient time	Convenient place	Recommended by peers, seniors, etc.	Suggested by teacher	Preference of e-materials	Profitable free time	For skills + knowledge	Total
Engineering	Mean	3.74	3.78	3.02	3.19	3.28	3.49	3.43	3.42
	SD	0.9951	0.9539	0.9692	0.9298	0.9669	0.9482	0.9471	0.6600
Science	Mean	3.80	3.87	2.99	3.38	3.35	3.66	3.55	3.52
	SD	0.9496	0.9562	1.0010	0.9206	0.9441	0.9396	0.9342	0.6533
Industrial Education and Technology	Mean	3.68	3.75	3.16	3.35	3.43	3.63	3.61	3.52
	SD	0.9877	0.9078	0.9875	0.9369	0.9446	0.9154	0.9223	0.6651
Information Technology	Mean	3.80	3.79	3.02	3.28	3.35	3.39	3.42	3.44
	SD	1.1652	1.0009	1.0156	0.9667	1.0466	1.0040	1.0434	0.6772
Architecture and Design	Mean	3.63	3.71	2.73	2.65	2.91	3.19	3.27	3.16
	SD	1.1450	1.1299	1.0980	1.0809	1.1230	1.1101	1.0624	0.8086
Bio-resource and Technology	Mean	3.73	3.64	2.68	2.86	2.82	3.50	3.64	3.27
	SD	0.9351	0.9535	1.0414	0.7743	0.8528	1.1019	1.0931	0.6484
Energy and Material	Mean	3.91	3.97	3.24	3.24	3.29	3.76	3.91	3.62
	SD	0.9651	0.9370	0.8187	0.8549	0.9055	0.7808	0.7927	0.5765
Liberal Arts	Mean	4.00	4.20	2.60	2.60	2.80	3.40	3.60	3.31
	SD	0.7071	0.4472	1.1402	1.1402	1.0954	0.5477	0.8944	0.5288
Graduate School	Mean	3.77	3.84	3.41	3.00	3.07	3.02	2.88	3.28
	SD	0.7626	0.7574	0.8692	0.7862	0.9314	0.8632	1.0102	0.5553
FIBO	Mean	4.00	3.86	3.71	3.14	2.57	2.43	2.57	3.18
	SD	0.0000	0.3780	0.4880	0.3780	0.7868	0.5345	0.7868	0.3843
F		1.0518	1.0140	5.4665	13.3978	6.9774	8.6120	7.2361	7.1794
Sig.		0.3957	0.4260	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

In terms of the content characteristics, the results of the study supported several viewpoints from many researchers mentioned previously. For example, similar to the observation made by Marsh (2004) and Woolfolk (2007), the students in this study stated as a preference the practicality of using websites that could help them to achieve short-term goals such as the undertaking of exam preparation, report work or other types of homework. Their preference for exercises with answers was also reflected in the study by Hudson (1984) on immediate feedback. Their search for new general information, illustrations and games supported the ideas of Elliott (2000) that materials should be interesting and enjoyable and also the ideas of Marsh (2004) that they should provide challenging and varied learning activities to maintain interest.

Based on the results of the study, this paper makes some recommendations on attractive features to e-material developers and educational web designers. The three most popular characteristics of e-materials and academic websites for the students in this study are user-friendliness, new general knowledge, and information for report and homework.

Since user-friendliness was ranked the highest by most students, material designers should consider the learners' convenience as first priority. According to Intratat (2009), certain characteristics of e-materials were considered desirable by the learners. For example, the table of content should be clearly provided in banners or drop-down windows. All topics in the table of content should be easily accessible in one click of the mouse.

When learners access selected topics, the layout should be clear and convenient for the reader. The text should preferably be limited to within one screen. If it is longer, scroll functions are needed. The exercises should also be objective with answer keys provided in self-access style. Types of exercises recommended are multiple choice, matching, cloze test and re-arranging of sentences. General principles to maintain user-friendliness are that the questions and choices of answer should be on the same screen so that the learners can choose the answers by clicking or dragging the mouse.

As for new general knowledge, the materials and websites are more attractive if they are updated or renovated from time to time. The information for report and homework should also be updated for temporary courses. In addition, examples of old exams with answer keys are quite popular among students. Last but not the least important, illustrations and games are also attractive, especially to undergraduate students.

It can be concluded that in designing e-learning materials, these characteristics above are essential because they attract the students' interest and arouse their intrinsic and extrinsic motivation. When students are motivated, they engage successfully in self-directed learning, which can subsequently lead to the development of an autonomous learning mindset suitable for life-long study.

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