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Investigation of Technical Support Provided by Educational Websites

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***Abstract*—The purpose of the paper was to identify how useful was the technical support provided by educational websites in relation to the interaction between students and educational websites, and the findings showed that students reported that all the identified technical support helped them achieve more productive usage of educational websites. Website designers and online teachers may find these results useful in enhancing the effectiveness of online teaching as well as designing and using instructional programs.**

Keywords: educational websites, online interaction, technical support

I. INTRODUCTION

There are various people associated with the design as well as the use of educational websites – students, teachers, programmers, advisers, graphics artists, website designers, writers and publishers. The relationship between students and educational website designers [1] is an indirect static link; anything the designers wish to provide has to be implicit in the design as normally designers will not have the opportunity to interact directly with students. Irele [2] states that the website designs should provide a platform for interaction between designers and students.

Designers may have laudable and innovative ideas, but unless the website is accessible and easy to use by students, the designers' ideas will have little impact on students. However, it is also possible to consider the ways in which students use websites in a general functional way. Website designers can provide different supports for both general and typical students. When online learning activities are designed and used, concern needs to be taken of the particular needs of different students.

Some researchers have shown their concern about the quality of educational websites [3] [4] [5] [6] [7]. They identified a number of contributing causes, including the lack of a theoretical basis in the design of most websites, often with an overemphasis on technical concern such as graphics and sound and under-emphasis on educational concerns.

The investigation of the technical support is concerned essentially with the issue: How students' success in online learning can be improved by using these websites. Good quality technical support for students may improve the students' success in online learning [8].

Technical support provided by educational website includes helping to download information, how to participate in discussion, web etiquette and quick response to problems, and also involves the students' technological competencies and other aptitudes (e.g., their ability to be self-directed, confident, motivated and willing to interact with teachers and peers through e-mail, chat rooms). Students need to have a comfort level when interacting with technical supports. Online students should know what technology is needed for their online learning before they decide to enrol in an online course. Therefore, students engaged in online learning requires technical support to be clear and readily available [9]. The technical support may include reliable networks, asynchronous and synchronous access, a quick response to technical problems, and simple instruction and navigation. Such support may also be critical to collaboration in an online context.

Moreover, researchers [2] [10] [11] identified a range of key features which students believed constituted good online technical support from educational websites, including that the website was well-designed, interactive, up-to-date, fast to download, easy to read, easy to navigate and appropriately visually designed [12]. Miller and Miller [9] provide three common technical support: An information centre that provides institutional and program information; computing helpdesks to troubleshoot technical issues; and call centres to support a particular program area. They further state that all these three must work together to support the whole learning process. Although much research has been undertaken about technical supports, further research is required to investigate how the technical support influences the online interaction and students' success in online learning.

II. HYPOTHESIS

In an attempt to build upon the previous research, the present study aimed to investigate the technical support provided by educational websites and their designers and how these supports influence students' interaction with the educational websites.

The interactions between students and educational websites have been examined. It was found that different technical support provided by the websites could influence significantly the interaction between students and educational websites. Students become more adept users of technology and develop a more positive attitude about technologies with the provision of clear and reliable

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technical support which may help students to interact with educational websites and achieve successful online learning.

Although existing research has been conducted about these interactions, further research is required to identify clearly the different technical support provided by the websites, especially how the support can facilitate the online interactions and influence students' success in online learning. There is a need to investigate further to what extent this support may be found useful by the students for online interactions, and why it is useful to students' success in online learning. Furthermore, among the technical support, further research is needed about which identified support has the most important impact on students' online interaction and their success in online learning.

III. METHODS

A . Participants

One hundred and fifty-two English language-major students in Changzhou University, China, participated in the questionnaire survey. Of the 152 participants, 129 (85%) were female, and 23 (15%) were male. The age range was from 19 to 25 years old. All the students were full-time students.

B. Instruments

The students' demographic background and their self reports about their liking of traditional classroom learning and online learning and their success in traditional classroom learning and online learning were investigated firstly. The students' reports on the usefulness of identified technical support from the educational websites were investigated. The identified factors in technical supports provided by educational websites and website designers were obtained from a pilot study. A 4-point scale was used: 1 = *not useful*, 2 = *somewhat useful*, 3 = *very useful*, and 4 = *essential*.

C. Procedures

The questionnaire survey was administrated with the assistance from the course coordinator and program directors. The survey was conducted at the beginning of Semester 2, 2005 and was 20 to 30 minutes in duration. Survey instruments were handed out to the students with the consent forms by the researcher and course coordinator. In the letter to the participant, they were informed about the purpose of the study, how long the survey was, and how the data would be stored and accessed. The survey was undertaken quietly in four classrooms at Changzhou University, China.

IV. FINDINGS

A. Means and percentages of technical supports

Clear evidence was found that students described the identified technical support as ones that were useful to the students' success in online learning. Students who rated themselves as successful in their online learning rated technical supports as more relatively useful.

Table I presents the means and standard deviations of the ratings of the usefulness of technical support provided by educational websites. The means of ratings are presented using a 4-point scale anchored 1 = not useful, and 4 = essential. All the means of the technical support were rated higher than 2 ("somewhat useful"). The means of five supports, viz., (a) tips on how to use electronic reference materials, (b) provision of access to technical (IT) assistance and responses about technical issues, (c) provision of search engine, (d) navigation guide of the website, and (e) electronic security measures such as how to secure ID and other personal information, were rated higher than "very useful". The mean of the factor "electronic security measures such as how to secure your ID and other personal information" was rated the highest.

TABLE I. USEFULNESS OF TECHNICAL SUPPORTS PROVIDED BY EDUCATIONAL WEBSITES (MEANS)

Supports	Mean	*SD*	*N*
• Electronic security measures such as how to secure your ID and other personal information	3.38	0.77	152
• Provision of search engine	3.03	0.81	152
• Tips on how to use electronic reference materials	3.01	0.81	147
• Provision of access to technical (IT) assistance and responses about technical issues	3.01	0.80	151
• Navigation guide of the website	3.01	0.80	152
• Back-up support using telephone and faxes	2.88	0.82	152
• Instructions on whom to approach for help	2.80	0.83	150
• A guide/help on using e-mail	2.66	0.87	152
• A guide/help on participating in a discussing group	2.36	0.80	151
• A guide/help on participating in a bulletin board	2.30	0.78	151
• A guide/help on participating in a chat room	2.20	0.78	150
• Other tools set up for communicating, e.g. video-conferencing	2.03	0.87	152

Note: (a) The means of the ratings are presented in order, from highest to lowest, using a 4-point scale anchored 1 = not useful, 4 = essential. (b) A repeated measures ANOVA on the above means revealed a significant effect, $F(11, 1540) = 46.9$, $p < .001$.

However, the mean of factor "other tools set up for communicating, e.g., video-conferencing" was rated the lowest in "somewhat useful".

A repeated measures ANOVA was applied across the 12 ratings. A significant effect was evident (see Table I). This suggests that students were discriminating effectively between the items.

Table II shows the percentages of ratings of the usefulness of the technical support provided by educational websites. The factor "electronic security measures such as how to secure your ID and other personal information" was rated as the most useful support with 85% (respectively) of the respondents rating this factor as a very useful (or above) support. However, the factor "other tools set up for communicating, e.g. video conferencing" was rated as the least useful support with 75% (respectively) of the respondents rating this factor as a little useful (or below) support.

B. Students' success in online learning (OSL) and technical supports

In Table III, correlations between students' self-reported OSL and the ratings of usefulness of the technical supports provided by educational websites are shown.

The ratings of two factors ("*guide/help on using e-mail*" and "*back-up support using telephone and faxes*") were found related significantly with the students' self-reported OSL (see Table III). Students who rated themselves as successful in their online learning rated the two factors as relatively more useful.

The variable "Success" was created by categorising the 6-point scale into two groups: 1 = less successful (from 1 to 3 in the 6-point scale), and 2 = successful (from 4 to 6 in the 6-point scale). Ninety-six students who reported 1 to 3 in the 6-point scale were less successful students in their online learning; while 55 students who reported 4 to 6 in the 6-point scale were successful students in their online learning (see Table IV).

TABLE IV. FREQUENCIES OF SUCCESS2

Success in online learning	***n***
Group 1: Less successful	96
Group 2: Successful	55

Note: N=151

It was found the rating of the factor "guide/help on using email" and the variable "Success' were related significantly, F (1 , 149) = 7.24, $p < 0.01$, $d = 0.46$. Students who rated themselves as successful in their online learning rated "guide/help on using email" as relatively more useful (see Table V). The relationship between the rating of the factor "back-up support using telephone and faxes" and the variable "Success' was presented with one-way ANOVA as well. A significant effect was found, F (1, 149) = 6.90 , p = 0.01 , d = 0.45. Students who rated themselves as successful in their online learning rated "back-up support using telephone and faxes" as relatively more useful (see Table V).

TABLE II USEFULNESS OF TECHNICAL SUPPORTS PROVIDED BY EDUCATIONAL WEBSITES (PERCENTAGES)

Supports	**1**	**2**	**3**	**4**
• Electronic security measures such as how to secure your ID and other personal information	1.3	13.8	30.3	54.6
• Provision of search engine	2.0	25.0	40.8	32.2
• Tips on how to use electronic reference materials	1.3	19.7	46.1	29.6
• Provision of access to technical (IT) assistance and responses about technical issues	3.3	19.1	48.7	28.3
• Navigation guide of the website	0.7	29.6	38.2	31.6
• Back-up support using telephone and faxes	1.3	36.8	34.9	27.0
• Instructions on whom to approach for help	4.6	28.3	45.4	20.4
• A guide/help on using e-mail	3.3	50.7	23.0	23.0
• A guide/help on participating in a discussing group	10.5	52.0	27.0	9.9
• A guide/help on participating in a bulletin board	10.5	57.9	21.7	9.2
• A guide/help on participating in a chat room	13.8	56.6	21.1	7.2
• Other tools set up for communicating, e.g. video-conferencing	28.9	46.1	17.8	7.2

Note: (a) All above figures represents percentages within each item.
(b) 1=not useful, 2=somewhat useful, 3=very useful, and 4=essential

TABLE III CORRELATION TABLE OF SELF-REPORTED SUCCESS IN ONLINE LEARNING CONTEXT (OSL) WITH RATINGS OF TECHNICAL SUPPORTS PROVIDED BY EDUCATIONAL WEBSITES

Item	***r***	***p***

• Electronic security measures such as how to secure your ID and other personal information	0.04	*ns*
• Provision of search engine	0.01	*ns*
• Tips on how to use electronic reference materials	0.06	*ns*
• Provision of access to technical (IT) assistance and responses about technical issues	- 0.01	*ns*
• Navigation guide of the website	- 0.02	*ns*
• Back-up support using telephone and faxes	0.22	0.007
• Instructions on whom to approach for help	0.06	*ns*
• A guide/help on using e-mail	0.20	0.014
• A guide/help on participating in a discussing group	0.16	*ns*
• A guide/help on participating in a bulletin board	0.03	*ns*
• A guide/help on participating in a chat room	0.07	*ns*
• Other tools set up for communicating, e.g. video-conferencing	0.08	*ns*

Note: N=152

TABLE V VARIABLES AND SUCCESS

Variable	Success2		*F (1,148)*	*p*
	Mean of less successful students (n = 96)	Mean of successful students (n = 55)		
Guide/help on using email	2.52	2.91	7.24	0.008
Back-up support using telephone and faxes	2.75	3.11	6.90	0.010

V. DISCUSSION

The findings showed that the ratings of all the identified technical support provided by educational websites were above "somewhat useful" to online interactions. This aspect of results is consistent with other research on technical support. For example, Miller and Miller [9] stated that the provision of technical support to students was very important for educational websites so that students could interact successfully with the websites and the technical support might support the whole learning process. Cashion and Palmieri [11] also identified that the successful online technical support provided by educational websites included the features that the websites should be easy to navigate, information secured, easy to interact and well supported with help desk. Wehmeyer [13] further stated that assistance in improving students' technological competencies provided students with the ability to navigate the Internet and locate information quickly. In the present study, the findings also show that the successful students rated technical support as more relatively useful than the less successful students. This finding emphasises the successful students are more concerned with their technological competencies to enrich their online learning knowledge.

The factor (*electronic security measures such as how to secure your ID and other personal information*) was rated as the most useful factor with 85% of the students rating it as relatively useful support. This finding shows that to secure the personal information online is very useful or essential in the students' online learning. It implies the need for comprehensive information security protection in the form of security policies and procedures, security education, security management and monitoring, user authentication, virus protection, data encryption, change control, logical barriers, physical barriers, information back-up and recovery strategies. The present finding shows that learning via the Internet requires increasing security services.

The ratings of two factors (*guide/help on using email* and *back-up support using telephone and faxes*) were found related significantly with the students' online success level and these factors were found significantly different in groups of the less successful students and the successful students. This aspect of results is consistent with the suggestions from Leask [10] and NCVER [14] that the technical supports may include asynchronous and synchronous access and the quick responses to the technical issues are necessary to students' success in online learning.

The factor (*back-up using telephone and faxes*) was found significantly different in groups of the less successful students and the successful students. The successful students valued this factor more than the less successful students. It is consistent with the statement from other researchers. Some researchers [9] stated that good support of communication technologies were used to facilitate contact and any back-up supports were used to improve the interactions when online learning was impossible or difficult for students.

VI. CONCLUSION AND RECOMMENDATIONS

Technical support can improve the students' technological competencies, and they also support the whole learning process. Security measures are essential in the students' online learning, and back-up supports are necessary when online learning is difficult for online students.

Further research is needed to investigate teachers and website designers' understanding about student's motivational factors and attitude towards the factors which may influence their online interactions and success in online learning, so that students can be involved actively in the online interactions. Investigating different support provided by educational websites can be undertaken in future research to assist designers and online teachers in enhancing the effectiveness of designing as well as implementation of the websites.

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