E-mentoring System Development using ARCS Motivational Strategies

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Abstract

An e-mentoring system is an online tool that enables interactive mentoring between a mentor and a mentee, regardless of place and time differences. This paper discusses the system design of an e-mentoring system for Malaysian orphans, called MyMentorMentee.com. The design of MyMentorMentee.com is an adaptation of Keller's ARCS Motivational model and uses its motivational elements to provide an effective mentoring experience for each session. A (attention), R (relevance), C (confidence) and S (satisfaction) are the four components of the ARCS motivational model. Keller's model provides techniques for solving the motivational problems faced by a learner during the learning process. The purpose of MyMentorMentee.com is to study how an e-mentoring system can overcome the motivational challenges faced by orphans which were identified during the preliminary study. Among these are personal issues and learning issues. The system was developed to help mentor and mentee to carry out the mentoring session using alternative (web-based) way at anytime and anywhere. The system that we have designed has 4 modules: personal profile, text messaging, mentoring schedule, and personal video chat. All modules were evaluated using quantitative and qualitative techniques.

Keywords: *E-mentoring system, ARCS Motivational Model, system design*

1. Introduction

Mentoring is a mutual relationship between two individuals in which a dedicated and encouraging individual volunteers his or her time to offer support to another individual in personal, academic or professional growth [1, 2]. Mentoring can be conducted in many different ways, including one-on-one mentoring, peer mentoring, group mentoring, and formal or informal mentoring [3]. For optimum communication between mentor and mentee, many mentoring programs are conducted face to face, where both meet in person at a pre-determined time and place [4].

The emergence of information technology (IT) has enabled mentoring programs to be conducted via the internet [5]. Communication between the parties is carried out in a virtual environment, employing communication technologies such as email, message boards, forums and websites to maintain interaction and to share and exchange information [6]. In this study, Malaysian orphans aged 11-17 were the mentees and undergraduate students were the mentors. The purpose of the project was to study how an e-mentoring system could overcome the motivational challenges that researchers identified in the children during the preliminary study. The two main types of motivational challenges were personal issues and

learning issues. Personal issues are personal challenges the orphans faced that affected their motivational level, such as their attitude towards teachers, school and friends, while learning issues are challenges experienced by the orphans in the learning process, such as their learning interest and study preference.

2. Existing e-mentoring System

Many examples of e-mentoring systems exist on the Internet. Some were built to provide online mentoring for school children, others for at-risk youth, university students, and professionals; there are even e-mentoring systems which specialize in serving only women (Table 1).

Table 1. Examples of e-mentoring systems

Mentoring program	Participant
MentorNet (www.mentornet.net)	Undergraduate students
Digital Heroes Campaign (http://www.globalenvision.org/library/10/416)	Teenagers
iMentor (www.imentor.org)	High school students
PA e-mentoring (www.pa-ementor.org)	High school students
Brightside UNIAID (www.thebrightsidetrust.org)	Teenagers
Mentoring & Befriending Foundation (www.mandbf.org)	All types of people
Women & Girls' Tech up (www.techup.org)	Undergraduates students
ICouldBe (www.icouldbe.org)	Teenagers
PERACH (http://www.perach.org.il)	Disable youth

The following section explains the theoretical framework used for this study and elaborates on the design and development of the MyMentorMentee.com e-mentoring system.

3. ARCS Motivational model

The ARCS Motivational Model consists of four attributes: A (attention), R (relevance), C (confidence) and S (satisfaction). The model was developed by John M. Keller in 1987 with the aim of finding ways to increase the motivation of students in the learning environment[7-9]. Each of the attributes plays a vital role in learning: gaining and sustaining students' *attention*, providing *relevance* in learning, building a positive expectancy (*confidence*) among students and stimulating *satisfaction* in learning[8].

Each attribute derives from several motivational theories that share the same characteristics, and each is divided into subcategories as depicted in Table 2 below.

Table 2. ARCS Motivational Model attributes

Attribute	Subcategories
Attention *To help instructor in establishing and sustaining student's interest and attention in learning process*	Perceptual arousal
	Inquiry arousal
	Variability
Relevance *To help instructor in meeting the student's need, interest and motives in learning process.*	Goal orientation
	Motive matching
	Familiarity
Confidence *To help instructor in developing an expectation of success among students' in learning process*	Learning requirements
	Success opportunities
	Personal control
Satisfaction *To provide an intrinsic and extrinsic reinforcement for effort in learning process*	Intrinsic reinforcement
	Extrinsic rewards
	Equity

The ARCS Model was chosen as the theoretical framework for this study because it encompasses elements important to the stimulation of human motivation. The application of the ARCS Model is not limited to the traditional classroom only, but is also applicable to online learning and therefore to designing a computer-based system. The model provides the motivational process to follow as well as the tools and techniques with which to evaluate the outcomes. Thus, the model is suitable for the development of an online mentoring system. The next section elaborates on the application of the ARCS Motivational Model to the design of the MyMentorMentee.com system.

4. System Design

System design can be described as a technical solution that satisfies the functional requirements of the system. In this study, the design of an e-mentoring system must incorporate the functional ARCS components and their supporting strategies, as mentioned in the previous section. The system consists of four modules: personal profile, text messaging, personal video chat and mentoring schedule.

Personal profile: This module provides information about each user, thus assisting mentor and mentee to get to know each other before the first mentoring session.

Text messaging: This module is an alternative to personal video chat. Users who prefer text to video can communicate with each other through messaging. User can change the font size, type and color, and can embed emoticons in their messages.

Personal video chat: This module allows users to communicate privately with each other in a visual mode, simulating a face to face encounter. Personal video chat also allows the use of text chatting to maximize the communication between mentor and mentee.

Mentoring schedule: This module helps mentor and mentee to stay on track with upcoming mentoring sessions. The mentor is able to set the time and date for the next mentoring session, which directly updates the mentee's account. The mentee has the option to accept or reject the proposed date with only one click of a button.

Besides these four main modules, MyMentorMentee.com also provides motivational information and website links, simple freeware games to attract and retain users' attention, and a gallery to display mentees' own artistic creativity.

The design and development of MyMentorMentee.com apply some strategies from previous studies that have applied the ARCS Model, with the addition of new strategies such as video chat and Malay as the main language of the system. Table 3 summarizes the strategies that have been applied in MyMentorMentee.com. The system can be accessed at this URL: www.mymentormentee.com.

Table 3. Comparison among previous and current ARCS design strategies

ARCS Design Strategies from previous literature[9-14]	ARCS Design Strategies applied in this study	Component addressed			
		A	R	C	S
-Consistent placement of screen title, keywords, objectives, summary -Multimedia and appropriate media -readable and understandable text	-Consistent placement of menus for every page -Consistent font-size & font-type for every page	x x		x	
-Sound and animation application -Unique sounds	-Motivational and inspirational quotes in home page -Animated menus and button	 x	x	x	
-Text images -Q &A boards -Variety of animated characters	-Emoticons in text message -Animated greeting text in home page		 x	x	
-Online and face-to-face activity -Attractive activities -Online announcements -Asynchronous online forum -Invite guests to give speeches and advice	-Video chatting between mentor and mentee -Text chatting while video chatting to maximize the communication -Personal text message between mentor and mentee		 x	x x x	x
-Multimedia (video, audio, animation and graphics)	-Blinking for unread message(s) -Emoticons -System identify user name when log in -Suitable icon on menus and buttons	x x x x	 x	 x	x
-Self-customization -Online support -Appropriate interactions -Menu bar , advance organizer, note taker, quick help, audio, calculator, navigation, screen layout, media & text area	-User can change display pictures at anytime -User is able to change their personal information at anytime -User-friendly calendar to make appointment and to view upcoming mentoring session -Pop-up reminder to fill in survey form before log out -User have personal control towards the system	x x x x	 x x x	x x x	x

-Divide the learning targets -Provide relevant information	-Do and don't during mentoring session are provided in the system -Provide inspirational quotes at home page -Objective of each module are provided in the system -Information regarding the program such as benefits, expectation and outcomes -Mentor and mentee is able to view each other information		x x x x	 x x	
-Learning objectives and formula -Help function -Dynamic content leveling	- Mentee are given the system manual to help them to understand how the system functions		x	x	
-Provide encouragement -Optimistic feedback -Give opportunities to the student to apply what they learn in real life setting	-A motivational feedback, advises are given during video chat and also text messages -User can send private text messages to each other -Communicate using video chat and text chatting	x x		x x x	 x x
-Continuous feedback -Promotes active participation in learning activities	-Text message feature is use to provide motivational feedback, praise and positive advise to specific individual			x	x

The features in the four modules in Mymentormentee.com may seem to be common features in many multimedia learning systems; however, these features are important in ARCS design strategies (see Table 3). Thus, this study must use these features in order to understand the motivational aspects among the orphans.

The system uses a MySQL database to store user data, PHP as its scripting language, and embedded open-source coding such as JavaScript and Ajax to ensure that the strategies applied will function well across various operating systems. The system was first tested on a local host before being uploaded to the paid server for easy access.

The consistent placement of menus on every page helps users navigate the system easily. Once a user is logged in, the system recognizes his or her name. The Malay language was chosen as the medium of instruction since it is the mother tongue for the mentees, and the aim is to make them comfortable in their environment. A blinking message alert on the right side of the main page denotes unread message(s) (Figure 1).

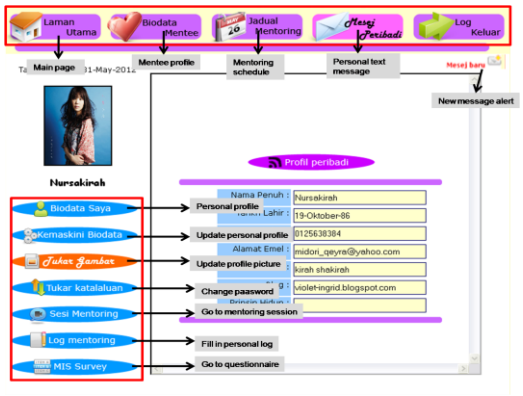

Figure 1. Homepage snapshot

Emoticons may be used to describe the mentee's or mentor's feelings. Users will also have personal control of message format when sending messages to other users, as they are able to change color, font size and font type (Figure 2).

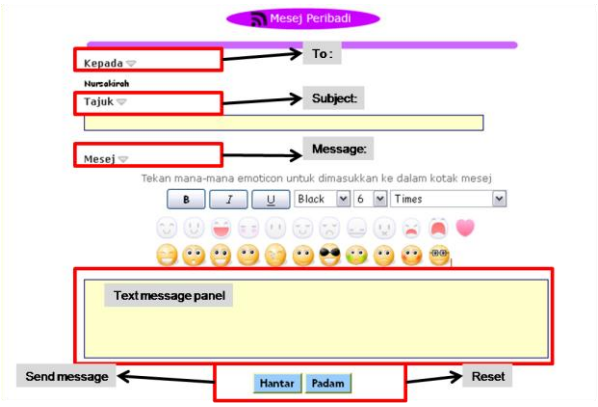

Figure 2. Personal message snapshot

Video chat provides the ability to see facial expressions and hear voice tones during the mentoring session, which can help the mentee feel more comfortable and confident in carrying on a conversation with their mentor. Users can customize the text color to differentiate between mentor and mentee messages. If they have a problem with the video chat, they can use the text chatting feature (Figure 3).

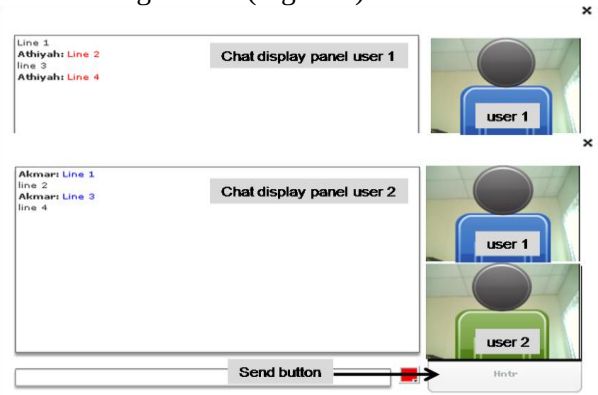

Figure 3. Personal video chat snapshot

5. Conclusion

This paper discussed the development of an e-mentoring system that uses ARCS Motivational Model strategies in its design. The strategies used are based on previous research that also applied the ARCS Motivational Model[9-14], with the addition of new strategies such as personal video chat to provide face to face mentoring, the choice of Malay (Malaysia's national language) as the main language and the use of emoticons to virtually show feelings.

These new strategies were added to suit the users' needs and ease the user into using MyMentorMentee.com. The users are underprivileged orphan children and teenagers and are not computer savvy, thus the purpose of the new strategies applied to this system is to make it as simple as possible, both in learning the system and in using it during mentoring sessions.

To evaluate the system, quantitative and qualitative techniques will be employed. Throughout 6 weeks of online mentoring session, participants are required to fill in a set of questionnaires at the end of every mentoring session. The questionnaire is use to evaluate user feedback towards MyMentorMentee.com. An in-depth interview will be conducted at the end of the online mentoring session. The interview will help researcher to discover in depth how the new strategies employed can help stimulate participants' motivational level.

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