

The Development and Evaluation of a Blog as the Virtual Interaction Medium for Physics Teachers

Pembangunan dan Penilaian Blog Sebagai Medium Interaksi Maya untuk Guru Fizik

Azlina Othman, Shahrul Kadri Ayop and Mohd Mustamam Abd Karim
Jabatan Fizik, Fakulti Sains dan Matematik
Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia
e-mail: azlinaothman82@yahoo.com, shahrul.kadri@fsmpt.upsi.edu.my &
mustamam@fsmpt.upsi.edu.my

Abstract

This study was conducted to develop a blog for the physics's teacher based on KBSM Physics Curriculum Specification. The blog was developed as an alternative medium to facilitate the virtual interaction and information sharing among teachers. The blog was developed based on the ADDIE Model using multimedia software. Blog evaluation was conducted on a total of 146 physics teachers from Kedah. The instrument used was a set of questionnaires, which consist of 18 items. The value of the Realibility Index obtained was 0.973. Results showed that the physics teachers possessed a positive evaluation toward the blog on content aspect (Mean=3.39, S.D=0.380) and the design aspect (Mean=3.25, S.D=0.465). The implication is that the developed blog is suitable as an alternative medium to facilitate the virtual interaction and information sharing among teachers.

Keywords blog, facebook, virtual interaction, physics teacher, ADDIE Model

Abstrak

Kajian ini dijalankan bertujuan untuk membangunkan sebuah blog berasaskan Huraian Sukatan KBSM untuk guru fizik. Blog ini dibangunkan sebagai suatu medium alternatif untuk memudahkan interaksi dan perkongsian maklumat dalam kalangan guru fizik secara maya. Blog dibangunkan berasaskan Model ADDIE dengan menggunakan perisian multimedia. Penilaian blog dijalankan ke atas 146 guru fizik di negeri Kedah. Instrumen yang digunakan ialah set soal selidik yang mengandungi 41 item. Nilai bagi Indeks Kebolehpercayaan yang diperolehi adalah 0.973. Dapatan kajian menunjukkan secara keseluruhan guru-guru memberi penilaian positif dengan tahap interpretasi tinggi bagi aspek kandungan blog (Min=3.39, S.P=0.380) dan aspek bentuk laman blog (Min=3.25, S.P=0.465). Implikasinya, blog yang dibangunkan ini sesuai dijadikan sebagai medium alternatif untuk memudahkan interaksi maya dan perkongsian maklumat dalam kalangan guru fizik.

Kata kunci blog, facebook, virtual interaction, physics teacher, ADDIE Model

INTRODUCTION

The existence of Web 2.0 Technology which is a technology and design of a second

generation internet, orientates the characteristics of contribution, collaboration and community (Razana Baharudin, 2012). The ability to create, store and disseminate information enables Web 2.0 to become the virtual space of choice for the generation of 21st century to express idea, share information and subsequently create an environment of discussions and interactive learning.

Facebook and shoutbox are some of the Web 2.0 applications that are capable of providing an active medium of communication virtually. According to Deitel (2009), blog is the abbreviation of ‘weblog’, which is a form of web application that is similar to writings (posting) on a general website. It is based on the concept of a post or article that has the chronology or known as the Reverse Chronical Order.

Blogs are able to assist in enhancing the education system in Malaysia. In fact, communication with communities all over the world can be done just at the tip of the finger. Other than easily maintained and updated, blogs can also be used as a meeting arena for teachers across Malaysia. It also functions as a place for teachers to exchange thoughts and opinions, besides sharing new ideas for a certain subject, especially physics. Teaching & Learning (T&L) contents from all over the world can be shared through the use of blogs.

The use of blogs as a virtual medium of teaching and learning content’s collection can become the basis of existence of the interactive community. According to Kennedy (2003), blogs are currently becoming the new dimension to develop an interactive publishing tool.

Although there are many blogs on physics, there are several constraints that bring about the need to carry out the development of the blog www.cikgufizik.com. The existing blogs on physics are mostly focusing only on content prepared or shared by the blog administrator. There are also blogs on physics that contain more of the content prepared only by a certain school committee on physics. In addition, international blog does not fit well with Malaysian syllabus context. The blog www.cikgufizik.com is designed to accomodate two-way communication between adminstrators and surfers as well as surfers with surfers.

The purpose of this study is to develop a blog based on the KBSM syllabus particularly for Form 4 and 5 subject. Later, the evaluation of the blog is carried out from the survey response by teachers as user.

RESEARCH METHODOLOGY

The study is developed based on the ADDIE Instructional Systems Design model (Suzuki, 2004) through five phases as illustrated in the Figure 1. Each phases is described in as the following:

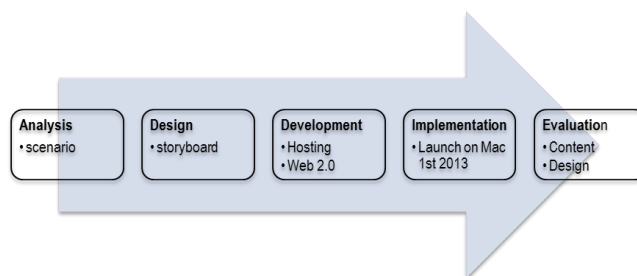


Figure 1 ADDIE model as the base of the study.

A-Analysis

Before the blog is developed, need analysis was carried out to determine factors which called the need of content-specific blog for teacher. One of identified factors is the need of information sharing in digital form asychronously (Cheng, 2010). In addition, teachers need peer support, especially novices and the time limitation due high workload hinders teachers to properly plan their teaching (Abang Mat Ali, 1998).

D & D-Design and Development

The blog design and development phases occur simultaneously. The process started with the storyboard sketching to determine the backbone of the blog (Rozinah, 2005). The blog is hosted by NetKL due to its excellent 24 hour support service and stability. Wordpress is used for blog editing because of its flexibility and search engine friendly (Ridwan and Arista, 2012).

Colaborative theory of learning is embedded in the blog development. Teachers are free to comment and give opinion on the information provided as well as sharing their content with peers with upload feature (Hafizul, Nazre and Harnani, 2012). Figure 2 shows the layout of the blog where web 2.0 tools are integrated to facilitate users interaction.



Figure 2 The blog layout

I-Implementation

The blog was made online available in Mac 2013. Since then, the blog evolves in term of content collection and design according to users feedback. The members of CIKGU FIZIK facebook group increased from 245 in July 3rd 2013 to 704 members in October 1st 2014. It is important to note that the facebook group is a closed group where each member has to be verified and approved my administrators. The process is essential to protect teachers privacy and their comfortability to share information among peers. Figure 3 shows how facebook is integrated as a supporting interaction medium in the blog, where members are free to ask help with peers. Shared content by members are available in the blog server.



Figure 3 Snapshot of facebook post by members of the CIKGU FIZIK group. (top) What is the different between aerofoil and aerodynamic? Thanks. (bottom) I request teachers' help.. is there any way to facilitate student understanding about the reflection of light (concave and convex). Thanks.

E-Evaluation

The evaluation was made in July 2014, 4 months after launching. The definition of evaluation is based on the user feeling and experience after surfing the blog (Zeithamal et al., 1990). The evaluation towards the blog are itemized in six constructs: (1) communication medium, (2) usage (3) suitability, (4) user friendly, (5) interactivity and (6) screen design. A survey instrument consisted of 21 items (adapted from The Survey of The Development of Resource Web for Civic Education Project, University of Malaya (<http://pendidikanmoral.um.edu.my/index.php?page=borang-kaji-selidik>)) is built to measure the mentioned constructs. The reliability index of the instrumen is $\alpha = 0.973$ involving 30 respondents. The instrument is validated by two experts in physics education research.

Data gathered by using the survey form with the Likert Scale of 4 points (4=Really Agree, 3=Agree, 2 Disagree and 1=Really Disagree). These data are analyzed using the *Statistical Package for Social Science (SPSS)* version 17.0 software. In this study,

descriptive statistics such as frequency, percentage, mean, and standard deviation are used to explain the result of the study. For the purpose of interpreting this blog, scores are divided into 3 levels based on the mean as in Table 1.

Table 1 Interpreting levels based on the mean

Class Scale	Mean Scale	Interpretation Level	Evaluation
$\frac{4-1}{3} = 1.00$	1.00 – 2.00	Low	Negative
	2.01 – 3.00	Medium	Positive
	3.01 – 4.00	High	Positive

RESULT AND DISCUSSION

146 respondents among physics teachers from Kedah evaluated the developed blog. The evaluation is classified into six constructs which can be categorized in two aspects:

1. Blog contents (communication medium, usefulness, suitability)
2. Blog design (user friendliness, interactivity, screen design)

The Aspect of Blog Contents

The mean score for the aspect of blog content is 3.39 out of 4.00, interpreted as positive and high level evaluation. The finding agrees the fact that that blogs function as a tool to disseminate or broadcast teaching contents as teaching plans and teaching aid. These contents can be used immediately after downloaded or modified in the classroom. (Kadger & Bull, 2003; Roberts, 2003).

(i) *Communication Medium*

Table 2 shows the mean score for each item under the construct of communication medium. The teachers' evaluation is positive (Mean = 3.53). This finding agrees with the study done by Nadia, Norasyikin and Nor Zuhaidah (2012), stating that blog can facilitate sharing of teaching aid content by teachers and communication with other teachers regardless of whether they are from the same school or not.

Table 2 Survey response in the construct of communication medium

Item		1	2	3	4	Mean Score (M)	Standard Deviation (S.D)
		STS	TS	S	SS		
		Percentage % (Frequency)					
cikgufizik.com blog and facebook group CIKGU FIZIK is:							
I1	Suitable as medium of teachers' community interaction network	0	0	42.5% (62)	57.5% (84)	3.58	0.496
I2	Time saving for physics-related discussion	0	0.7% (1)	49.3% (72)	50.0% (73)	3.49	0.515
I3	Strengthening teacher-teacher relationship with the usage of facebook, chat, shoutbox and email.	1.4% (2)	0.7% (1)	39.7% (58)	58.2% (85)	3.55	0.588
I4	Facilitating discussion on physics	0	1.4% (2)	51.4% (75)	47.3% (69)	3.46	0.527
I5	Providing space for user comments toward the uploaded content and inputs for continuous improvement .	0	0	44.5% (65)	55.5% (81)	3.55	0.499
Mean						3.53	

(ii) Usefulness

The mean score for the usefulness construct is at a high level of 3.34 (Table 3). Respondents were asked on the usefulness of each categorical menus provided in the blog. Contents in the blog should be systematically managed so that it is easily accessible for immediate use. Integration of knowledge among teachers about specific topic using blog leads to the generation of more content experts (Ferdig & Trammel, 2004).

Table 3 Survey response in the construct of usefulness

Item		1	2	3	4	Mean Score (M)	Standard Deviation (S.D)
		STS	TS	S	SS		
		Percentage % (Frequency)					
I6	Information provided in the following categorical menu is useful for physics teacher.						
a	Teaching & Learning	0	0	54.8% (80)	45.2% (66)	3.45	0.499
b	Form 4	0	0	52.1% (76)	47.9% (70)	3.48	0.501
c	Form 5	0	0	58.2% (85)	41.8% (61)	3.42	0.495

Table 3 Cont...

d	Question Bank	0	2.1% (3)	53.4% (78)	44.5% (65)	3.42	0.536
e	Education Issue	0	8.2% (12)	61.6% (90)	30.1% (44)	3.22	0.581
f	Video	0	6.2% (9)	60.3% (88)	33.6% (49)	3.27	0.570
g	Teacher Professional Development	0	4.1% (6)	63.0% (92)	32.9% (48)	3.29	0.538
h	Other	0	12.3% (18)	60.3% (88)	27.4% (40)	3.15	0.614
Mean						3.34	

(iii) Suitability

Table 4 shows the scores components of the blog on content suitability. The mean score is 3.01 which is at high level of evaluation. This construct strengthens the previous construct (usefulness), showing that the provided contents are not only useful but also appropriate for them as physics teachers at SPM level.

Table 4 Survey response in the construct of suitability

Item						Mean Score (M)	Standard Deviation (S.D)
		1	2	3	4		
		STS	TS	S	SS		
		Percentage % (Frequency)					
17	The teachers found that the provided contents suit them.						
a	Teaching & Learning	0	1.4% (2)	57.5% (84)	41.1% (60)	3.40	0.518
b	Form 4	0	1.4% (2)	61.6% (90)	37.0% (54)	3.36	0.508
c	Form 5	0	1.4% (2)	66.4% (97)	32.2% (47)	3.31	0.492
d	Question Bank	0	4.1% (6)	53.4% (78)	42.5% (62)	3.38	0.566
e	Education Issue	0	6.2% (9)	61.6% (90)	32.2% (47)	3.26	0.564
f	Video	0	5.5% (8)	65.1% (95)	29.5% (43)	3.24	0.542
g	Teacher Professional Development	0	6.2% (9)	58.2% (85)	35.6% (52)	3.29	0.577
h	Other	0	9.6% (14)	58.2% (85)	32.2% (47)	3.23	0.608
Mean						3.31	

The Aspect of Blog Design

The mean score for the aspect of blog design is at a high level of 3.25 out of 4.00. The result met the criteria for good education blog proposed by Gillani, B.B. & Relan (2004).

(i) User Friendliness

Table 5 shows the items evaluation for user friendliness with a high mean average of 3.34. According Sharina Sobri (2012), education-based web needs to cover a few important aspects such as user friendliness to facilitate access to contents. A blog that has the user friendliness characteristic enables users to access contents easily and increases the interest of users to keep surfing the blog. The response shows that the developed blog has good user friendliness feature.

Table 5 Survey response in the construct of user friendliness

Item	1	2	3	4	Mean Score (M)	Standard Deviation (S.D)	
	STS	TS	S	SS			
	Percentage % (Frequency)						
The following feature is easily used.							
I8	Content download	0	3.4% (5)	55.5% (81)	41.1% (60)	3.38	0.553
I9	Menu navigation	0	8.2% (12)	54.8% (80)	37.0% (54)	3.29	0.610
I10	Hyperlinks	0	2.1% (3)	63.7% (93)	34.2% (50)	3.32	0.511
I11	Sitemap shows overall blog content	0	4.8% (7)	52.1% (76)	43.2% (63)	3.38	0.578
Mean						3.34	

(ii) Interactivity

Table 6 shows the score for each item under the construct of interactivity. The mean score is 3.33, rated at high level of evaluation. Baharudin Aris (2002), admitted that interactivity that allows hyperlinks to other blogs can increase the interest and motivation. The interactivity characteristic of the blog is well reflected by the scores obtained from the survey.

Table 6 Survey response in the construct of interactivity

Item	1	2	3	4	Mean Score (M)	Standard Deviation (S.D)	
	STS	TS	S	SS			
	Percentage % (Frequency)						
The following feature is easily used.							
I12	Optional Menu	0	3.4% (5)	54.1% (79)	42.5% (62)	3.39	0.556
I13	Link to other blog/ resources	0	6.8% (10)	60.3% (88)	32.9% (48)	3.26	0.576
Mean						3.33	

(iii) Screen Design

Stephen, 1997 stated that one of the important task in the web development is to ensure it’s attractiveness through well designed display. To develop a blog that can fulfil the need of the users, the multimedia elements in the screen design has to be taken into consideration. The multimedia elements are text, colour, graphics, animation, video and audio (Baharuddin Aris, Manimegalai Subramaniam and Rio Sumarni Shariffudin, 2001). Table 7 shows score for each elements. The mean average is 3.09, rated high level of evaluation.

Table 7 Survey response in the construct of screen design

Item					Mean Score (M)	Standard Deviation (S.D)	
	1	2	3	4			
	STS	TS	S	SS			
	Percentage % (Frequency)						
The following characteristics are attractive.							
I14	Text	0	13.0% (19)	58.9% (86)	28.1% (41)	3.15	0.625
I15	Colour	3.4% (5)	15.8% (23)	54.1% (79)	26.7% (39)	3.04	0.751
I16	Graphics	0	19.2% (28)	56.2% (82)	24.7% (36)	3.05	0.662
I17	Animation	0	18.5% (27)	59.6% (87)	21.9% (32)	3.03	0.637
I18	Video	0	9.6% (14)	66.4% (97)	24.0% (35)	3.14	0.563
I19	Audio	0	11.0% (16)	67.8% (99)	21.2% (31)	3.10	0.560
Mean						3.09	

Based on suggestions by respondents of the study, the researcher has made continuous improvement changes in terms of colour and graphic since these items scored the least.

Teacher Subjective Comments

In addition to the objective response, comments and feedback from respondents are welcome at the end of the distributed survey. This is to get suggestion for continuous improvement of the blog and response toward the specific aspect, which is not covered in the survey. Among the received responses are as follow:

(Teacher 1) *Congratulation, it is an extremely great and interesting blog. Thank you for sharing such blog.*

(Teacher 2) *Satisfied with the creativity and the effort by the blog developer.*

(Teacher 3) *No comments as I am satisfied with the blog because it facilitates the work*

of physics teachers and I had certainly hoped for such a blog to exist, thanks for your effort.

(Teacher 5) *I'd like to get the T&L content in Bahasa Melayu and funny video clips to be shared with the students in class. I was immediately attracted the first time I surfed this blog. Keep up the noble effort for mutual benefits. Congratulation teachers!*

(Teacher 6) *The blog is equipped with videos of experiments such as visual labs to help ease the affairs of conveying knowledge effectively and easily by the teachers, nevertheless, I am very satisfied with the current existing blog content.*

CONCLUSION

A blog for physics teacher in the framework of KBSM has been successfully developed based on ADDIE model. Evaluation toward the content and the design of the blog resulted in mean score of 3.39 (S.D=0.380) and 3.25 (S.D. 0.465), respectively. The blog provides virtual interaction medium for teachers to download and upload content, share ideas and discuss issues about teaching and learning of physics.

ACKNOWLEDGEMENT

We would like to acknowledge the scholarship awarded from Ministry of Education via Hadiah Latihan Persekutuan (HLP) to Azlina Othman.

REFERENCE

- Abang Mat Ali bin Abang Masagus. (1998). Strategi menangani tekanan di kalangan guru-guru sekolah menengah zon a di bahagian kuching/samarahan. Sarawak : Satu tinjauan. Sarawak : Jabatan Pendidikan Sarawak.
- Baharuddin Aris, Manimegalai Subramaniam & Rio Sumarni Shariffudin. (2001). Reka bentuk perisian multimedia. Johor: Universiti Teknologi Malaysia.
- Baharuddin Aris. (2002). Reka bentuk antaramuka pengguna. Johor: Universiti Teknologi Malaysia.
- Cheng Yen Wang. (2010). Educational implications of blogs for enriching adult collaborative distance learning. *International Journal of Continuing and Lifelong Learning*. Volume 2. Taiwan: Kuohsiung Normal University
- Deitel, H.M., Deitel, P.J. & Nieto, T.R., 2009. *Internet and World Wide Web: How to Program*. (4th ed.) Upper Saddle River:Prentice Hall.
- Ferdig R.E. & Trammel, K.D., (2004). Content delivery in the blogosphere. *T.H.E Journal* 31(7), 12-20.
- Gillani, B.B., & Relan. (1997). Web-based information and the traditional classroom: similarities and differences. Dalam B. H. Khan (Ed.), *Web-Based Instruction*. (pp. 41-46). Englewood Cliffs, New Jersey: Educational Technology Publications.
- Hafizul Fahri Hanafi, Nazre Abdul Rashid, & Harnani Mat Zin. (2012). Pembelajaran kolaboratif dengan blog, wiki dan rss. Dalam *Pembelajaran Berasaskan Web Isu dan Trend*. Perak : Penerbit Universiti Pendidikan Sultan Idris.
- Kajder, S., & Bull, G. (2003). Scaffolding for struggling students. *Learning & Leading with Technology*, 31(9), 32-35

- Kennedy, K. (2003). Writting with Web logs. TechLearning: *The resource for educational technology leaders*. Diperoleh pada 23 Julai 2012 daripada http://www.techlearning.com/db_area/archieves/TL/2003/02/blogs.html
- Nadia Akma Ahmad Zaki, Norasikin Fabil & Nor Zuhaidah Mohamed Zain. (2012). Penggunaan blog dalam pengajaran dan pembelajaran. Dalam *Pembelajaran Berasaskan Web Isu dan Trend*. Perak : Penerbit Universiti Pendidikan Sultan Idris.
- Razana Baharudin. (2012). Teknologi Web 2.0 dan Pendidikan : Anjakan paradigm peranan guru dan pelajar. Dalam *Pembelajaran Berasaskan Web: Isu dan Trend*. Perak : Penerbit Universiti Pendidikan Sultan Idris.
- Ridwan Sanjaya & Arista Prasetyo Adi. (2012). Ciri Terhebat Blog Wordpress. Selangor : PTS Netmedia Sdn.Bhd.
- Roberts, S. (2003). Campus communications & the wisdom of blogging. Syllabus Magazine, 5. Diperoleh pada 20 Mac 2013, daripada <http://www.syllabus.com/>
- Rozinah Jamaludin. (2005). Multimedia Dalam Pendidikan. Kuala Lumpur: Utusan Publication & Distributors.
- Sharina Sobri. (2012). Tinjauan penggunaan blog dikalangan pelajar dalam bidang pendidikan. Tanjong Malim: Universiti Pendidikan Sultan Idris.
- Stephen, V. E. (1997). Guide to methods for students of political science. New York : Cornell University Press.
- Suzuki, K. (2004), "Development process of e-Learning", Japan:Kumamoto University. (pp.2-4).
- Zeithamal, V.A., Parasuraman, A. dan Bery L.L. (1990). Delivering Quality Service: Balancing Customer Perceptions and Expectations. New York: The Free Press.