



## E-Learning Motivational Assessment

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### ABSTRACT

Information Communication and Technology (ICT) has become important in an education environment that improves the teaching and learning environment such as by using e-Learning. In a private university in Malaysia as a case study, the e-Learning has been developed in the year 2010. The Learning Management System (LMS) was managed by each campus. The e-Learning website has contained information such as subject, lecturer profile, student profile, and sharing the learning material. This research has been conducted to evaluate e-Learning (VLE) using Website Evaluation Instrument (WebCHECK Professional), to investigate motivational dimensions which are Simulating, Meaningful, Organized and Easy to use between students while using e-Learning (VLE) and to propose recommendations for developer to improve the motivational element in e-Learning (VLE). A total of 320 students took part in answering a set of questionnaires related to e-Learning (VLE) in a private university in Malaysia. The data from the surveys were analyzed using Website Evaluation Instrument (WebCHECK Professional). The evaluation of e-Learning (VLE) using WebCHECK Professional shows that the e-Learning (VLE) website is Awesome. The motivational dimensions of e-Learning (VLE) have shown the website is easy to use with a total score of 19.82. It is recommended that the developer should improve the design and user interface of the e-Learning (VLE) website.

**Key words:** Motivational dimensions, e-Learning

### 1. INTRODUCTION

Motivation can be defined as set as motion [1]. The motivation makes a person keep moving and support to complete the task [2]. Motivation in context learning has been stated in Table 1.

**Table 1:** Definition of Motivation

Definition of Motivation	Reference
Motivation refers to the magnitude and direction of behavior. It also refers to the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect.	[3]
Motivation refers to a person's desire to pursue a goal or perform a task, which is manifested by the choice of goals and effort in pursuing the goal.	[4]
Motivation refers to what people desire, what they choose to do, and what they commit to do. In other word, motivation explains what goals people choose to pursue and how actively they pursue them.	[5]
Motivation is the process whereby goal-directed activity is instigated and sustained.	[1]

Based on the motivational definition above, motivation can be defined as how people act or behave to achieve the goal. The term "motivation" is used to be influenced by the purpose of one reason, which will affect the model of behavior.

#### 1.1 E-Learning

e-Learning is a significant learning technology in any country in educational development and has developed the knowledge for the nations. This role is not restricted to educators as it helps to improve the skills of the current education technique to use the latest trends of tools and pedagogies for learning. Online learning has obtained and utilized the knowledge and stimulates by the electronic environment. Web-based teaching material such as multimedia CD-ROMs, websites, discussion boards, collaborative software, and combination

methods of teaching. The process of understanding the range of mixed learning approaches e-Learning [6]. E-Learning becomes important to the teaching and learning situation [7].

### 1.2 Website Evaluation Instrument (WebCheck)

Website Motivational Analysis Checklist (WebMAC) Professional had been developed to measure the motivation dimension [8]. The motivational quality or procedure for website design can be evaluated by using WebMAC Professional. WebMAC consists of eight instruments, six instruments designed for education contexts and another two is for business contexts. WebMAC was renamed to WebCHECK: The Evaluation Instrument in 2012 IMLS SPARKS Ignition Grant for Libraries. The four instruments has been updated which includes the WebCHECK Junior for lower elementary students (16 items), WebCHECK Middle for upper elementary (24 items), WebCHECK Senior for high school students (32 items) and WebCHECK Professional for educators (48 items).

The WebCHECK instruments have been categorized into four characteristics which are Stimulating (S), Meaningful (M), Organized (O), and Easy to Use (E). A Stimulating website that stimulates curiosity and attracts and keeps attention and interest. A Meaningful website covers reliable, applicable, and reachable information. An Organized website that shows information with perfect, rational, and orderly structure. An Easy to Use website is simply navigated and searchable. Educators can evaluate the website using WebCHECK Professional [9]. The WebCHECK Professional has been used in this research to evaluate the motivational dimension when using ELearning (VLE).

WebCHECK Professional has four characteristics which are (1) Stimulating, (2) Meaningful, (3) Organized, (4) Easy-to-used. [9] is measured the Stimulating, Meaningful, Organized, and Easy-to-used calculation to conduct the research. The calculation score is based on the number of questions multiply with rating score and add all the rating scores. The calculation process is the same in all category of characteristic which is  $(R1 \times 0) + (R2 \times 0) + (R3 \times 1) + (R4 \times 2) + (R5 \times 3)$ . The ratings will be described by the following order:

R1: if rating = 0

R2: if rating = 0

R3: if rating = 1

R4: if rating = 2

R5: if rating = 3

The information regarding the score for each of the items on the WebCHECK instrument. Items with a score of 3 are highly rated. Items with a score of 2 may need some revision or modification. Items with a score of 1 or 0 are in serious need of revision or modification. Another research that has been done using the WebMAC evaluation tool is shown in Table 2.

**Table 2:** Research Using WebMAC Evaluation Tool

Country	Research Title	Reference
Brazil	Evaluating Motivational Aspects of web-based English Language Course through WebMAC	[10]
Brazil	Tele-Education on Leprosy: Evaluation of an Educational Strategy	[11]
Malaysia	Investigating Motivational Dimension of E-Learning	[12]
Malaysia	Investigating Motivational Dimensions for E-Learning: A Case Study of Dental Students	[13]
Malaysia	Assessment of Motivational Qualities for E-Learning Website	[14]

The research conducted by Ferreira (2000) [10] stated that WebMAC has been used to evaluate the motivational aspects of subject assessment. The participants among 26 adult students have participated in an Online English course called Surfing and Learning program. The result showed that the WebMAC characteristics which are Organized and Easy to Use stated the high ranking.

Educational strategies have been used to a tele-education leprosy course evaluated by Paixao et al. (2009) [11]. The course has been designed for the Brazilian Family Health Team members. Based on WebMAC characteristics, it was evaluated as an “awesome course”. The strategies that have been applied revealed the top motivational program.

Similar researches are being done on using WebMAC instruments [12] [13] [14] in Malaysia. Future work may include investigating motivational dimensions for augmented reality [15], and ubiquitous education system [16].

## 2. METHOD

A total of 320 students took part in answering a set of questionnaires related to e-Learning (VLE). The data from the surveys were analyzed using Website Evaluation Instrument (WebCHECK Professional). The evaluation of e-Learning (VLE) using WebCHECK

### 3. RESULTS AND ANALYSIS

The sample consists of 320 students from 1450 students of a private university in Malaysia. The demographic profile included age, race, religion, gender, programmed, internet experience, the usage of e-Learning (VLE) per day, per week, and the period of study. The highest category 21-24 years old is 183 students as shown in Table 3.

**Table 3:** Sample-Based on Type of Age

Category	Quantit
y	y
≤20	108
21-24	183
25-28	28
29-30	1
>30	0
Total	320

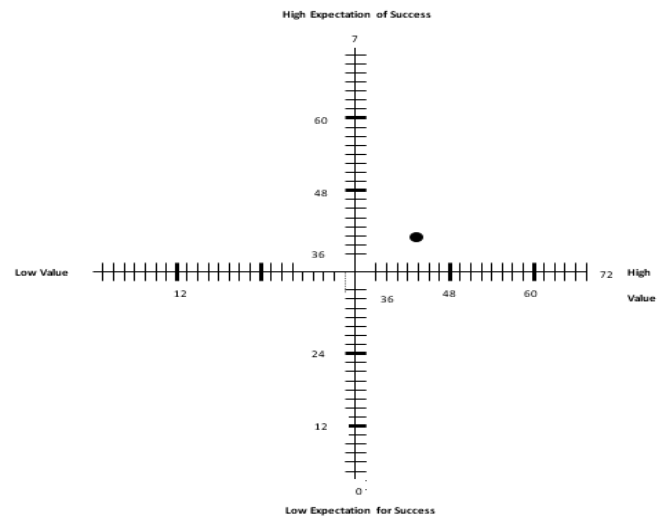
The first objective is to evaluate the e-Learning (VLE) website using the WebCHECK Professional (WebCHECK). The result from survey analysis has shown the result of the transformation of score analysis for students. Figure 1 stated the score transformation based on the Stimulating (S), Meaningful (M), Organized (O), and Easy to Use (E). V stated the summary score for Value dimension and XS stated the total score for Expectation of Success dimension. Based on the summary of the score, it showed this website is high (Awesome).

#### 3.1 Analysis of Contributing Factors

$$S+M = V$$

$$O+E = XS$$

A score of 27 or higher on one or more of the four factors is a high score but still may require modest revision. If four factors score 27 or higher, the website is measured as an overall Awesome website. A score between 18 and 26 on any factors means that the factor is above average but could be improved with some modifications. If any factors scores between 9 and 17, it is considered below average, requiring substantial revision. A score of 8 or below on any factor is considered low and requires the most comprehensive improvements.



**Figure 1:** The Plotting of Score Graph

Table 4 presents the summary of the score for the Value of Dimension (V) which contains the value of Stimulating and Meaningful.

**Table 4:** Summary of Score for the Value Dimension (V)

Sample	S + M	V
student s	18.88+ 18.81	37.69

Table 5 shown the summary of the score for the Expectation for Success (XS) which contains the value of Organized and Easy to Use.

**Table 5:** Summary of Score for the Expectation for Success (XS)

Sample	Low Expectation of Success	High Expectation of Success
student s	19.38+ 19.82	39.20

The second objective is to investigate motivational dimensions between students while using e-Learning (VLE). The calculation below will be used in this study to determine the rating score in all categories. The investigation of this study is based on the data collection and the calculation process shown below. All the results from this study will be discussed as follows.

#### 3.2 Stimulating (S) Score Analysis

Table 6 stated the Stimulating (S) score analysis for students. The highest score is Q9 which is 1.854. The average score for this characteristic among students is 18.88. The variety of formats for presenting the information helps to maintain the attention of students using the e-Learning (VLE).

**Table 6:** Stimulating Score Analysis

Question	Total Score	Average Score
Q1	491	1.658
Q5	444	1.500
Q9	549	1.854
Q13	478	1.614
Q17	439	1.483
Q21	483	1.631
Q25	468	1.581
Q29	420	1.418
Q33	406	1.371
Q37	479	1.618
Q41	463	1.564
Q45	467	1.577
Total		18.88

**The calculation for Stimulating:-****Calculation process: (R1×0)****+(R2×0)+(R3×1)+(R4×2)+(R5×3)**

- Q1. The visual layout of this Website attracts attention.
- Q5. There is nothing on this Web site that distracts attention from the content.
- Q9. This Web site provides opportunities for interactivity through participatory features (e.g. social networking, games, polls, commenting, etc.)
- Q13. There are opportunities to read and/or share different ideas and viewpoints that make this Web site interesting.
- Q17. A variety of formats for presenting information (e.g. text, images, sounds) helps maintain attention without limiting persons with disabilities from access to that information.
- Q21. This Web site has a novel or unique feature that makes it more interesting.
- Q25. This Web site stimulates curiosity and exploration.
- Q29. The content on this Web site is fresh and engaging.
- Q33. This Web site's content is current and up-to-date.
- Q37. This Web site provides a list of resources that may be accessed to obtain additional information.
- Q41. Functional hyperlinks within and outside of this Web site stimulates further exploration of content.
- Q45. I would re-visit this Web site.

**3.3 Meaningful (M) Score Analysis**

Table 7 presents the meaningful (M) score analysis among students. The total average score is 18.81. The highest average score for this characteristic is Q22 which is 1.668.

**Table 7:** Meaningful Score Analysis

Question	Total Score	Average Score
Q2	468	1.581
Q6	470	1.587
Q10	400	1.351
Q14	466	1.574
Q18	437	1.476
Q22	494	1.668
Q26	470	1.587
Q30	473	1.597
Q34	482	1.628
Q38	473	1.597
Q42	453	1.530
Q46	484	1.635
Total		18.81

**The calculation for Meaningful:-****Calculation process: (R1×0)****+(R2×0)+(R3×1)+(R4×2)+(R5×3)**

- Q2. This Web site provides adequate coverage of topics presented.
- Q6. This Web site provides links to other related or useful Web sites.
- Q10. This Web site appears to contain credible information.
- Q14. The information contained in this Web site is current and up-to-date.
- Q18. Information on this Web site appears to be accurate.
- Q22. This Web site contains little or no redundant or irrelevant information.
- Q26. This Web site provides accessible opportunities for all (including those with visual, hearing and mobility impairments) to actively participate and contribute content.
- Q30. This Web site provides opportunities to communicate with its creator(s) or author(s).
- Q34. The author and/or publisher of this Web site is explicitly stated.
- Q38. The authority of this Web site author(s) or creator(s) is readily discernible.
- Q42. The authority of this Web site author and/or publisher is credible for the content.
- Q46. This Web site's content either provides an objective perspective or makes its bias known.

**3.4 Organized (O) Score Analysis**

Table 8 shows the score of organized dimension in using e-Learning (VLE). The total average for organized (O) is 19.38.

**Table 8:** Organized Score Analysis

Question	Total Score	Average Score
Q3	511	1.726
Q7	464	1.567
Q11	493	1.665
Q15	463	1.564
Q19	475	1.604
Q23	473	1.597
Q27	483	1.631
Q31	467	1.577
Q35	466	1.574
Q39	496	1.675
Q43	467	1.577
Q47	479	1.618
Total		19.38

**Table 9:** Easy to Use Score Analysis

Question	Total Score	Average Score
Q4	492	1.662
Q8	471	1.591
Q12	503	1.699
Q16	469	1.584
Q20	475	1.604
Q24	486	1.641
Q28	477	1.611
Q32	511	1.726
Q36	517	1.726
Q40	501	1.692
Q44	466	1.574
Q48	500	1.689
Total		19.82

**Calculation for Organized:-**

**Calculation process: (R1×0)  
+(R2×0)+(R3×1)+(R4×2)+(R5×3)**

- Q3. Visual (e.g. videos, photographs) or audio content included in this Web site helps to clarify or describe the topic(s) presented.
- Q7. The purpose of this Web site is clear.
- Q11. The organization of this Web site is simple and clear.
- Q15. The information on this Web site is well-organized.
- Q19. The information on this Web site is presented in a clear and consistent manner.
- Q23. The text at this Web site is well-written grammatical, spelling or other errors.
- Q27. This Web site provides adequate coverage of topic(s) presented.
- Q31. No matter where I am in this Web site, I can return directly to the home page.
- Q35. This Web site's design uses a navigation system that enables efficient access to any Web site section from any page on the site.
- Q39. When clicking hyperlinks, the ability to revisit the selected path (i.e. via a "breadcrumb trail" or the Web browser's back button) is available.
- Q43. This Web site works well whether or not pop-up functionality is enabled on a Web browser.
- Q47. Video or multimedia content may be launched in a new window or frame so as not to get lost when accessing this content.

**3.5 Easy to use (E) Score Analysis**

Table 9 presents the score of easy to use for students. The average mark for this characteristic is 19.82.

**The calculation for Organized:-**

**Calculation process: (R1×0)  
+(R2×0)+(R3×1)+(R4×2)+(R5×3)**

- Q4. Navigating this Web site does not require any special skills or experience.
- Q8. This Web site provides an easy-to-use help function.
- Q12. This Web site makes it easy to search or query for information.
- Q16. Features of this Web site are easy-to-use.
- Q20. The features on this Web site are active and functioning.
- Q24. At this Web site, I can control what information I wish to access.
- Q28. Buttons, links and other navigation mechanisms work the way they should on this Website.
- Q32. There is little or no delay in accessing media content from this Web site.
- Q36. The information on this Web site is accessible to all, including those with sight impairments, by providing content that is screen reader-enabled, employing descriptive audio and offering a simple design to assist those using magnification tools.
- Q40. The information on this Web site is accessible to all, including those with hearing impairments, by offering closed-captioning and/or transcripts of audio content.
- Q44. The information on this Web site is accessible to all, including those with mobility challenges, by offering an uncluttered screen design that requires limited dexterity to navigate.
- Q48. This Web site is optimized for mobile access (i.e. Smart Phones, tablets, etc.).

**3.6 Motivational Graph**

The Motivational Graph is based on the average marks for four characteristics. Figure 2 shows the Motivational Graph for students. Based on the Motivational Graph, the score between 18 and 26, it indicates the factors is above average

but can be improved with some modifications. The graph showed that Easy to Use has the highest score which is 19.82. Table 10 shows the total score analysis

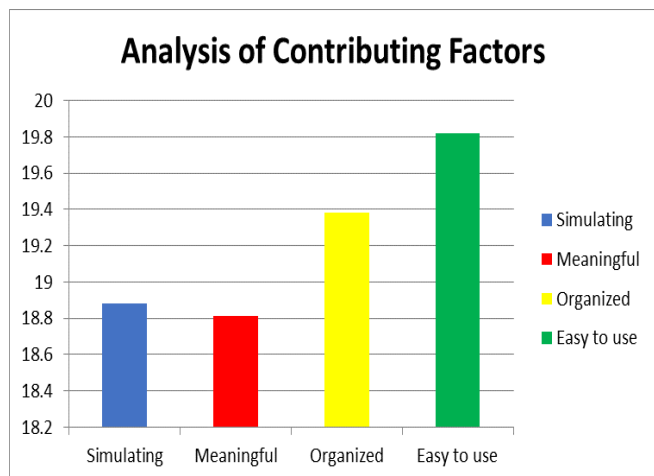


Figure 2: Motivational Graph

Table 10: Total Score Analysis

Category	Score
Simulating	18.88
Meaningful	18.81
Organized	19.38
Easy to use	19.82

The third objective is to suggest the recommendation for the developer to improve the motivational dimensions in e-Learning (VLE). The students had been recommended some suggestion on how to improve the e-Learning (VLE) website. Information in the e-Learning website must be updated every day. The e-Learning can be more interesting if the website is more colorful. The students also suggest the e-Learning website can link to another research website. Another recommendation such as make a better forum layout to encourage conversation in e-Learning (VLE). When the student opens the .pdf file, it must open in the new tab automatically. The student also suggests the environment could be improved when using the mobile version.

#### 4.0 CONCLUSION

From the data analysis in this chapter, the result has shown the sample characteristics based on demographic, evaluation e-Learning (VLE) website, the motivational dimension, and the recommendation based on student suggestions to improve the website. The result of the objectives had been identified in this chapter. This research has investigated the motivational dimensions using e-Learning (VLE) among students for a private university in Malaysia. Based on the motivational graph, it indicates the website is above average but can be improved with some modifications. The result showed the

Easy to Use (E) is the highest characteristic where the website has displayed the information with a perfect, rational, and structure arranged in a clear position. Another score is transformation based on the situation (S), meaningful (M), organization (O), and easy to use (E). V stated the summary score for the Value dimension and XS stated the total score for the Expectation of Success dimension. Based on the summary of the score, it showed this website is high (Awesome).

The finding of this study will benefit the developer to make the website more attractive and useful. The result from this research will lead to a discussion of future research in the part of motivational and user interface design. Implementing the e-Learning strategies will make the student revisit the e-Learning (VLE) website. The student experience when using e-Learning (VLE) will improve the student learning performance. The ideas and new improvement area can be discussed in future research from developer will increased the number of students to revisit the e-Learning (VLE) website. The design and layout of the e-Learning (VLE) need to improve to attract the student to use the e-Learning for their study.

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#### REFERENCES

1. P. R. Pintrich, and D. H. Shuck. *Motivation in Education: Theory, Research and Applications*, Englewood Cliffs, NJ: Prentice-Hall, 1996.
2. S. Wongwiwatthanakul, and N. G. Popovich. *Applying the Arcs Model of Motivational Design to Pharmaceutical Education*, *American Journal of Pharmaceutical Education*, Vol. 64, No. 2, pp. 188-196, 2000.
3. J. M. Keller. *Motivational Design of Instruction*, in *Instructional Design Theories and Models: An Overview of Their Current Status*, C. M. Reigeluth, Ed. Hillsdale, NJ: Lawrence Erlbaum Associates, 1983.
4. J. M. Keller (2007). *Motivation and Performance*, in *Trends and Issues in Instructional Design and Technology*, R. A. Reiser, and J. V. Dempsey, Eds. Upper Saddle River NJ: Pearson Education, 2007, pp. 82-92.
5. J. M. Keller. *Motivational Design for Learning and Performance: The Arcs Model Approach*, Springer Science & Business Media, 2010.
6. T. Bates. *National Strategies for E-learning in Post-Secondary Education and Training*, Paris: International Institute for Educational Planning, UNESCO, 2001.
7. L. Harasim, S. R. Hiltz, L. Teles, and M. Turoff. *Learning Networks: A Field Guide to Teaching and Learning Online*, Cambridge: The MIT Press, 1995.

8. R. V. Small, and M. P. Arnone. **Assessing the Motivational Quality of Web Sites**, in *Managing Information Technology Resources in Organizations in the Next Millennium: 1999 Information Resources Management Association IRMA International Conference*, M. Khosrowpour, Ed. Idea Group Publishing, 1999, pp. 1000-1003.
9. R. V. Small, and M. P. Arnone. **Webcheck Professional: formerly Webmac Professional**, Center for Digital Literacy, Syracuse, NY, 2013.
10. A. Ferreira. **Evaluating motivational aspects of a web-based english language course through the website motivational analysis checklist (webmac)**, in *Proceedings of ED-MEDIA 2000-World Conference on Educational Multimedia, Hypermedia & Telecommunications*, Montreal, Canada: Association for the Advancement of Computing in Education (AACE), 2000, pp. 1641-1643.
11. M. P. Paixão, H. A. Miot, and C. L. Wen. **Tele-Education on Leprosy: Evaluation of an Educational Strategy**, *Telemedicine and E-Health*, Vol. 15, No. 6, pp. 552-559, 2009.  
<https://doi.org/10.1089/tmj.2008.0137>
12. W. A. R. Wan Mohd Isa, A. I. H. Suhaimi, I. N. Ismail, and J. E. Luaran. **Investigating Motivational Dimension of E-Learning**, *International Journal of Advanced Science and Technology*, Vol. 29, No. 6 Special Issue, pp. 1588-1594, 2020.
13. I. Mohd Amin, W. A. R. Wan Mod Isa, A. F. Sidek, H. Ibrahim, and Z. A. Zulkipli. **Investigating motivational dimensions for e-learning: a case study of dental students**, in *2013 IEEE Business, Engineering & Industrial Applications Colloquium*, IEEE, 2013, pp. 214-218.
14. F. Mohd Saman, W. A. R. Wan Mohd Isa, and N. A. Mazilan. **Assessment of motivational qualities for e-learning website**, in *2010 International Conference on User Science Engineering*, IEEE, 2010, pp. 77-82.
15. M. Kassim, and M. T. H. Md Zubir. **Design of Augmented Reality for Engineering Equipment in Education**, *International Journal of Advanced Trends in Computer Science and Engineering*, Vol. 8, No. 6, pp. 2773 – 2781, 2019.  
<https://doi.org/10.30534/ijatcse/2019/15862019>
16. Z. Lahbi, and M. Sabbane. **U-Edu: Multimodal Learning Activities Analytics Model for Learner Feedback in Ubiquitous Education System**, *International Journal of Advanced Trends in Computer Science and Engineering*, Vol. 8, No. 5, pp. 2551 – 2555, 2019.  
<https://doi.org/10.30534/ijatcse/2019/103852019>