User Experience Evaluation in using Web-Based Learning Planning Application

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Abstract—**User experience is known as a user's subjective feeling in utilizing particular products. Among users or groups of users may be varied in experiences of using a similar information system product, so that it is essential to create a measurement of user experience. Measuring user experience needs a collection of feedbacks given by a group of users who utilize a certain product. This study aims to evaluate an online study planning application by using User Experience Questionnaire (UEQ) consisting of 26 matched attributes that oppose each other, of which is able to represent a product used by university students in planning their study online. UEQ is given to 106 university students who represent nine different study programs. Results show that efficiency attribute is slightly above average, while others such as tractive power, clarity, preciseness, stimulation and the latest form are below average. The results are expected to be used as a material to evaluate, reconsider and improve the product of online-based study planning application for UX practitioners, HCI educators, and program developers.**

Keywords—user experience, study plan application, UEQ

I. INTRODUCTION

Study planning is a process usually happened in a change of semester where every college student should determine and apply pockets of courses, including the schedules and types of classes, for their upcoming semester program via online-based study planning application. The aim of applying study plan is to give students chances to self-plan their study with appropriate courses that are relevant to students' interests. Some points to aware in filling study plan are that students must know a list of offered courses, classes and schedules. They also need to reconsider courses chosen by looking at course requirements. Afterwards, they can ask for academic supervisors' approval and print it out as a proof of enrolment.

Since 2010 to 2011 academic periods, there is an invented system in a form of online-based or web-based study planning application that can ease numbers of processes [1]. By using the web-based application, it is aimed to make students easier in doing study plan during the given application times. This online-based study planing application is created by using Relational Database Management System (RDBMS) Oracle Enterprise 10G and considering the performance level and the security. The language used within the a`pplication is a form of PHP the fifth version, javascript and HTML. The rationale of using PHP is due to its Open Source characteristic and easiness in learning and implementing across possibly developed platform [2].

Unfortunately, since the online-based study planning application have been implemented, there is no measurement conducted to reveal user experience that covers user's method in getting attractive and effective experience, so that they do not feel frustrated, bored, and disturbed during the usage. User experience describes user's subjective feelings or opinions of a particular product used [3]. UEQ is used as one measuring tool that can assess user experience and the interactive product fast. The format used in UEQ can support the users to express their feelings, impressions, and behaviours occurred during the use of the product. This questionnaire consists of 26 coupled attributes that oppose each other in term of meaning [4] and are able to represent the product. The questionnaire scales involve six attributes of user's feelings namely tractive power, efficiency, preciseness, stimulation and latest form. The result of measurement of user experience is essential to develop the recent online-based study planning application, of which has been used for seven years. Moreover, this development is also useful for particular stakeholders such as UX practitioners and Human Computer Interaction (HCI) educators.

II. THEORETICAL FRAMEWORK

A. Web-based Study Plan Application

Study planning is also a process of approving students' study plan done by the academic advisor.
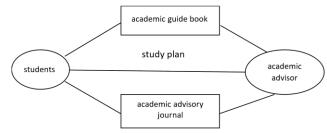

Fig. 1. The Relationship between Students and Academic Advisors

Figure 1 describes the procedures in study planning done by students with their academic advisor, of which is based on an academic guide book previously socialized by the university. Students who have conducted advisory program will be listed in an academic advisory journal [5]. An advisory program only can be conducted when students have completed the study plan in each beginning of semester based on the academic calendar applied in the university. Even up to this day, an advisory program is only conducted when students can meet the academic advisor face-to-face, in a case of consultation and approving. The existence of this online application will fasten the advisory process and avoid a long queue. In addition, this application gives the academic advisor effective and efficient times in checking the courses undertaken by the students. If only the courses chosen are precise regarding some considered points, the academic advisor will approve the study plan. However, if it is on the contrary, the advisor will provide other courses that are relevant to what the student should enrol or apply.

B. User Experience (UX)

UX is a field related to the relationship between humans and technology. At glance, its relationship is studied under Human Computer Interaction (HCI). HCI experts study about computer's capability (mostly in a form of technology products) in interaction with humans, whereas, humans' ability is studied under Cognitive Psychology or Human Factors. UX is a process or effort to signify user's satisfaction (users of application, or website browsers) in improving the usage and satisfactory feelings which are given within interaction between those users and product of information system. For example, if a user can access a website, he might be questioning what easiness they can get while using it, whether there are benefits, efficient and clear procedures. Similarly to when a user buy an e-commerce product, he might be also questioning whether the procedure is easily understood and promotes efficiency in any forms.

In addition, UX is all about understanding users. It aims at knowing the product's users, the users' goals and the users' ways of doing some works. It focuses on how a product can help the users, including but not limited to helping to overcome problems. Most misunderstanding coming within society is that UX is about beautiful appearance, interesting illustration, or eye catching background colours or pictures. Those aspects may be influential to the product, however, those are not the prominent aspects in UX. Actually there are three influential criteria in an application or a website determining good UX namely subjective, usable and consistent.

Subjectivity of a good UX is still debatable even up to this day. However, this problem is interesting to be arisen as a reference, especially the fact that it is important for online application to know their web visitors including their characteristics. Further, this will determine what online application or website that should be created, involving its structure, layout and other components. The second criterion is usable, an important factor in determining UX as it deals with easy usage of the product. When a user visits a certain website,

naturally he will use some visualizations appeared or provided in the website. This process is known as the process of introduction and learning of the online application or website either from the function or the message the website gives. In short, if a person who is unfamiliar with all the website procedures finds difficulty in using it, thus, UX level can be determined as less interesting. The third criterion is about consistency. Several websites also have consistency problems which can be categorized into two types; internal consistency (among components in a website) or consistency with international convention or standard. These consistencies are applied to the layout or look and feel of any pages of websites. Even each page has different functions, the consistency in a look and feel or any other components can make users feel comfortable in using the website.

III. RESEARCH METHODS

A. User Experience Questionnaire (UEQ).

This study investigated the user experience on using a web-based study planning application. The measurement used was done using User Experience Questionnaire (UEQ). UEQ was a form of questionnaire that could be used to measure the level of user experience (UX) of a certain product [6]. There were six

annoying	enjoyable	1
not understandable	understandable	2
creative	dull	3
easy to learn	difficult to learn	4
valuable	inferior	5
boring	exciting	6
not interesting	interesting	7
unpredictable	predictable	8
fast	slow	9
inventive	conventional	10
obstructive	supportive	11
good	bad	12
complicated	easy	13
unlikable	pleasing	14
usual	leading edge	15
unpleasant	pleasant	16
secure	not secure	17
motivating	demotivating	18
meets expectations	does not meet expectations	19
inefficient	efficient	20
clear	confusing	21
impractical	practical	22
organized	cluttered	23
attractive	unattractive	24
friendly	unfriendly	25
conservative	innovative	26

scales used with 26 total attributes categorized based on UEQ's scale criteria [4].

Fig. 2 Total Attributes Categorized User Experience Questionnaire

Figure 2 shows the form of UEQ consisting of 26 coupled attributes that oppose one another. The data obtained were

further processed into data transformation and calculations of average score, variance, standard deviation, confidence interval, and comparison with the used benchmarks [6]. The scales in UX drawn in UEQ included: a) attractiveness to the product revealing users' like or dislike category; b) efficiency while using it, revealing the possibility of products' efficient usage; c) perspicuity of the product, revealing the visibility of easy utilization; d) dependability, investigating whether the users were under interactive control, or whether the interaction between the product and the users was safe and easily predicted; e) stimulation, knowing at the users' happiness and motivation in using the product; f) novelty, revealing whether the product's design was innovative and creative that could attract the users to use.

A set of benchmark data was a collection of data obtained from 4818 participants based on 163 total researches in any forms of products such as business, websites, web stores, and social connections. Validity and realibility can be analyzed by seeing the calculation of product-moment correlation introduced by Pearson and Cronbach alpha schore [7]. Henceforth, a researcher could know whether the data were sufficient and suitable for being the base of measuring UX levels.

B. Population and, Sample

The population used in this research is active students in academic year 2016/2017 with the number of 1560 students. The sampling technique used was Stratified Random Sampling Proportional [8] with Slovin formula [9]. The Slovin's formula:

$$n = \frac{N}{1 + (N \times e^2)}$$

Where; n = # of sample size N = total population e = confidence level

N = 1,560 residents

e = standard confidence level is 90% - 95%.

The researchers used a confidence of 90% for a better accuracy, which will give a margin error of 0.10.

$$n = \frac{1560}{1 + (1560 \times (0,1)^2)}$$

$$n = \frac{1560}{1 + 15,6}$$

$$n = \frac{1797}{16,6}$$

$$n = 93,976$$

$$(\approx 94)$$

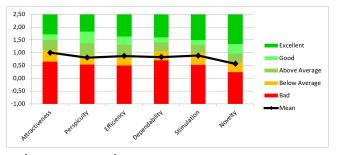Calculations using the Slovin formula obtained a minimum sample is 94 students in order to represent the existing population. The more samples taken will also be more representative. The minimum sample size is 94 students based on the proportional stratification example. This is done because the population members are heterogeneous and come from 9 different groups, so in each group, the data is taken proportionately.

TABLE I. POPULATION AND SAMPEL

Group	Number of Student	Proportion	Sampel
001	81	0.0519	5
002	37	0.0237	2
003	742	0.4756	45
004	40	0.0256	2
005	203	0.1301	12
006	222	0.1423	13
007	57	0.0365	3
008	40	0.0256	2
009	26	0.0167	2
010	112	0.0718	7
	1560		94

IV. RESULT AND ANALYSIS

The distribution of UEQ was done to 106 university students representing 9 study programs and six graduation periods from 2011 to 2016. In 2011 period, there were 12 times of using the web-based study planning application and this number represents the highest number in accessing the application. Meanwhile, in 2016 period, the new users of the application were only twice in using the application up to this

study was composed.

Fig. 3. Comparative Graphic

Figure 3 is a result of UEQ measurement that shows an average score of UX scales from the use of web-based study planning application with a provided set of Benchmark data. Results of the measurement show that the scores in efficiency attribute were above average, while other five attributes got

below average. Figure 4 describes the details of the calculation result gotten from UEQ distribution.

TABLE II. CALCULATION RESULTS OF UEQ

Graph to show the result relative to the benchmark

Scale	Lower Border	Bad	Below Average	Above Average	Good	Excellent	Mean
Attractiveness	-1,00	0,65	0,44	0,41	0,22	0,78	1,0016
Perspicuity	-1,00	0,53	0,37	0,47	0,45	0,68	0,8066
Efficiency	-1,00	0,5	0,34	0,47	0,33	0,86	0,8726
Dependability	-1,00	0,7	0,36	0,34	0,2	0,9	0,8278
Stimulation	-1,00	0,52	0,48	0,31	0,19	1	0,8868
Novelty	-1,00	0,24	0,39	0,33	0,38	1,16	0,5684

V. CONCLUSIONS AND RECOMMENDATIONS

Based on above explanations, it can be concluded that web-based study planning application can help students easily plan their study at the beginning of each semester. Unfortunately, in coping with user experience, the users still feel that the application is monotone and less attractive. The perspicuity, dependability, stimulation and novelty attributes of the product are far from what to be expected. Therefore, it is important to be done further studies to know in details what causes that make perspicuity, dependability, stimulation and novelty attributes are categorized as below average. A possibly further study may work on the measurement of the product measurement especially on users' satisfactory level, so that, it can be clearly drawn for the betterment. In addition, to deal with novelty attribute, it is essential to develop the product in Android or iOS platforms.

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REFERENCES

[1] A. Hodianto, "Rancang Bangun Penjadwalan dan Perwalian Berbasis Web di Stikom Surabaya", 2011.

[2] R. Nixon, "Learning Php, Mysql, Javascript, Css & Html 5", O'Reilly Media, 4 edition, December, 2014.

[3] H. B. Santoso, M. Schrepp, R. Y. K. Isal, A. Y. Utomo, B. Priyogi, "Measuring User Experience of the Student-Centered e-Learning Environment", Vol 13 Number 1, The Journal of Educators Online, 2016.

[4] Rauschenberger, M., Olschner, S.; Cota, M.P.; Schrepp, M., Thomaschewski, J., "*Measurement of user experience: A Spanish language version of the user experience questionnaire (UEQ)*", Information Systems and Technologies (CISTI), 2012 7th Iberian Conference, 2012.

[5] Setiawan, A., Wibawa, M. F., & Burhanudin, A. "Analisis Kebutuhan Sistem Informasi Perwalian Mahasiswa Berbasis Website Studi Kasus Teknik Informatika UM Magelang", *Konferensi Nasional Sistem Informasi* (pp. 684-687), Bandung: Institut Teknologi Bandung, 2016.

[6] Laugwitz, B.; Held, T., Schrepp, M. "Construction and evaluation of a user experience questionnaire". In: Holzinger, A. (Ed.): USAB 2008, LNCS 5298, pp. 63-76, 2008.

[7] Widiyanto, J. "SPSS For Windows", Surakarta: Badan Penerbit - FKIP Universitas Muhammadiyah Surakarta, 2012.

[8] Cochran, W. G., Sampling Techniques (3rd ed.), Wiley India, 2007.

[9] Sevilla, Consuelo G, et al, Research Methods, Rex Printing Company. Quezon City, 2007.