

# Evaluating *in-house* Online Assignment Submission System (OAS) in an e-Learning environment: A case study

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**Abstract**— The *in-house* developed Web-based Online Assignment Submission (OAS) system is a robust web-based online assignment submission system for students and tutors at Wawasan Open University. With respect to the demands of its fairly diverse and mobile student population and to the constraints of submission of students' assignments, the first *in-house* built OAS was developed in late 2007. It was created especially to facilitate students' online assignment submission anywhere, anytime and make it for possible tutors to download students' Tutor-Marked Assignment (TMA) and upload marked assignments together with online feedback to individual students. The OAS has been through developmental changes several times since it first debuted in July 2008. Such developmental changes have yet to be evaluated from the end-user perspective. The intention of the system was to better facilitate end-users experiences compared to previous or existing systems. This study looks into students' and tutors' responses regarding perceived *efficiency, helpfulness, control* and *learnability* of *in-house* built OAS. A survey questionnaire was distributed to students and tutors to obtain data. The findings of this study suggest both that participants were generally quite positive in their overall impression of the four tested components. Tutors responses were found to be more positive than students in terms of the *efficiency* component. This study also verified the perceived positive features of OAS and identified some concerns about features that need to be further improved such as inflexibility to revise mistakes and length of time it takes to upload files. Findings of this study can help to provide guidelines for similar future system development to an OAS in an e-learning institution.

**Keywords**- *e-learning; Online Assignment Submission System, course management tool, ODL tools & technologies*

## I. INTRODUCTION

With the increasing interest in, and concentration on distance education and e-learning, the concept has seen phenomenal, exponential growth, especially in the Asian region. The growth is partly due to globalisation and the competitiveness of higher education as well as the development of information and communication technologies (ICT) all of which have brought a dramatic transformation to Asia [11]. In many countries, distance universities have been developed to respond to the educational needs of working adult learners who wish to gain skills to advance in their careers without the need to step into a traditional brick-and-mortar classroom. Wawasan Open University (WOU) is the first charity funded, not-for-profit, privately established open distance institution dedicated to working adult learners in Malaysia. Since its first intake of students in January 2007, the University has provided distance and e-learning education to over 8,000 adult learners from

across six regional offices in Malaysia – Penang, Ipoh, Kuala Lumpur, Johor Bahru, Kuching and Kota Bahru. The presentation of course content in the distance learning mode ensures that learners do not have to sacrifice their work commitments by enabling them to study on their own time and at their own pace [14].

The tutor-marked assignment (TMA) is one of the important elements in assessing distance learners' understanding of the materials presented in the distance learning mode. Normally, TMAs make up 40% - 50% of the total student grade. The remaining 50% - 60% of the students' grades are contributed by the final exam paper, which they must take personally at a scheduled date, time and location. When the university was officially launched in 2006, the physical submission of TMAs required the students to present their assignments during the scheduled tutorial day. However, such practices posed inconveniences for students who cannot attend the tutorial due to personal reasons, as well as the fact that tutors often needed to make several trips to regional offices to collect late TMA submissions. In addition, physical submission of TMAs required a significant amount of paperwork to be completed by tutors for proper claims and compensation. The entire physical submission process is tedious, labour intensive, prone to human error and expensive in terms of the time and natural resources consumed. Many requests for variation were made either by students or by tutors trying resolving physical submission issues. With respect to the demands of its fairly diverse and mobile student population and to the constraints of submission of students' TMAs from six regional offices, the university realised the need to create greater accessibility and flexibility to the student groups. The *first in-house* built Online Assignment Submission (OAS) system was developed beginning in late 2007. It was created especially to facilitate students' online assignment submission from anywhere, anytime and make it for possible tutors to download students' TMAs and upload marked assignments together with online assignment feedback to individual students.

The OAS system is a robust web-based system for students and tutors. Although OAS has been through developmental changes several times since it first debuted in July 2008, such developmental changes have yet to be evaluated from the end-user perspective: namely the students and the tutors. The intention of the system was to better facilitate end-users experiences compared to the previous systems of handling students TMA submissions. This study looks into students' and tutors' responses regarding perceived *efficiency, helpfulness, control* and *learnability* aspects regarding effective feedback mechanisms of the functions enabled by the OAS.

## II. BACKGROUND & LITERATURE REVIEW

The WOU developed web-based Online Assignment Submission (OAS) system is a robust assignment handling system designed to replace the manual, unpractical physical TMA submissions for students. The previous TMA submission was too resource intensive and had not been successfully accepted by stakeholders, primarily the students and tutors. There are 5 various stages in of the OAS process from the specification of TMA submission to the student's retrieval when marking is complete by tutor and subsequently released by the course coordinator (lead instructor). The OAS Repository Database (OAS\_RD) is the central and major component of the system which stores all stakeholders' information such as students' personal information, enrolments classes, TMA assignments for the enrolled classes, tutors' personal information, TMA assignments, etc. Figure 1 illustrates how stakeholders interact with the OAS. As shown in the diagram, there are separate web interfaces for different stakeholders to accommodate differing stakeholder requirements, as needs from the three sets of stakeholders vary.

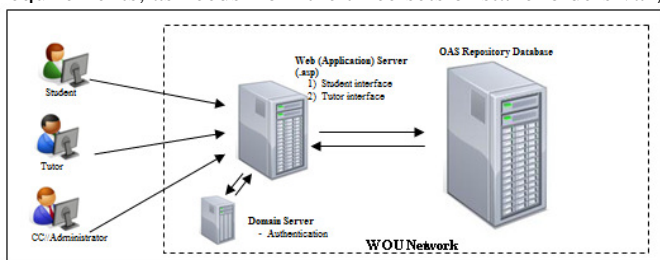


Figure 1: OAS Architecture

The process flow of student submission in OAS is processed in 5 different stages. Stage 1, the Course Coordinators (CC) set up course requirements → Stage 2 Student TMAs Submission → Stage 3 Tutor Marking (Download/Upload) → Stage 4 CCs Moderation/Release → Stage 5 Student Grade Retrieval.

With the full implementation of the OAS system across the 6 regional offices, no paper assignments or email submission are needed, which has dramatically helped reduce the time consuming administrative work for both tutors and CCs. The system enables easy and safe access through the internet so students can conveniently submit and check their TMA status at their own convenience. This in turn helps students who are enrolled at outstations, on a job assignment, or elsewhere.

Studies on distance education courses contend that there are many benefits associated with online assignment submission compared to the physical delivery of hard copy assignments [3][7][15]. According to Weir [15], a network-based e-submission (online) provides greater convenience and flexibility to match local conditions and preferences compared to physical submission.

The e-submission of assignments has been widely used in classrooms for many years in forms such as electronic (email), file transfer protocol (FTP), shared file locations or even web-enabled (online). As Bridge and Appleyard [3] noted 'the use of online assignment submission and management is recommended for in Higher Education establishments where students may be remote.' The web-based (online) assignment system and electronic marking system, a.k.a OAS, at Queensland University of Technology [1] was created in

response to the growing number of students and wide acceptance of use of electronic methods for receiving and processing student's assignments and examinations. The OAS have been well received by students where they find it convenient to submit their assignments from home and later retrieve marked assignments through the web compared to having to collect hard copies. The key advantages of implementing such a system is that it provides the functionality of submitting assignments but also provides a convenient facility to assist the lecturers in marking the assignments all in a web browser environment. The system, however, was aimed towards particular subjects assignments such as C programming, databases, Visual Basic, Java programming and written documents. The BOSS system [9],[10] was among the earliest developer of automatic assignment submissions. The BOSS system allows students to submit programming assignments online to run those program languages against the test data. Although it is not an automatic marking system and the lecturer still needs to manually undertake a marking scheme, compared to non-computer-mediate schemes it helped the administrative staff and lecturer reduce the time involved considerably. Griffiths and Joy [5] extended the functionality of BOSS to improve plagiarism detection and enhanced the user interface in HCI design to increase acceptance by student users. Work on BOSS was again carried in the academic year 2004 - 2005 by evaluating the BOSS system from three perspectives – technical, usability, and pedagogy [6]. The group of researchers study reported that at the technical level the system is robust with regards to integration of plagiarism detection software, platform independence with client-service architecture that enabled the adoption of technology changes (such as Unix or windows or Mac-based). Pedagogically, the BOSS system has sufficient features and functions that adequately support the needs of all stakeholders for course management and assessment tools besides traditional face-to-face classroom and lab classes. In terms of usability, their study reported the current web interface for lecturer users is regarded as overly complex due to its depth-emphasising programming structure.

A similar online assignment submission system was developed at the Open University of Israel that provides alternative ways for students send their assignments via regular email. The assignment system is a Web-based system that enables students to submit assignments online, track its status, and receive feedback from the graders. However, the use of the system is mainly voluntary. A study was conducted to determine the factors behind the slow adoption of the system since the University-wide implementation in 2007. The results from the study showed that students' behavioural intention to use the system was influenced mainly by its perceived usefulness, its ease of use, and the individual's attitude towards new technologies. The findings also suggested that students may not have been sufficiently encouraged to use the assignment system due to the voluntary policy set by the University [12]. Other factors that can also contribute to slower adoption are learners' preferences for printed materials for reasons of portability, dependability and ergonomics [4][13].

The purpose of the study described in this paper is to evaluate a built *in-house* OAS from the end-users' perspectives – the primary users are students and tutors groups. Specifically, this study sought to answer four research questions as follows:

Q1. What differences exist between these two groups regarding *efficiency, helpfulness, control* and *learnability* of the *in-house* built OAS?

Q2. What are the perceived positive and negative aspects of the *in-house* built OAS?

### III. RESEARCH METHODOLOGY

The current study deals with students' and tutors' views regarding *in-house* built OAS during the July semester of 2011 at Wawasan Open University. To measure and evaluate the *efficiency, helpfulness, control* and *learnability* aspects of the OAS, the study employed a series of constructive questions to gauge the participants' views on specific items. Specifically, the detailed descriptions of the four scales assessed in this study are presented in Table 1:

Table 1

<i>Efficiency</i>	User's perceived that the system is responsive, straightforward, clear screen layout, accessible and do what is intended to do
<i>Helpfulness</i>	User's perceived that the system communicates in a helpful way that meets their needs (i.e. help and support provided)
<i>Control</i>	User's perceived that the system is responding in a normal, consistent way, and assists them in the event of errors
<i>Learnability</i>	The ease with which the user becomes familiar with system; whether there are user guides, rules, tutorials, etc

A university-wide online survey questionnaire was sent and distributed at the end of semester. Participation in the survey was voluntary and data collection lasted about two weeks. The study recorded 132 students and 51 tutor participants, who were enrolled or who tutored in the July semester. Students and tutors who did not complete the survey questionnaires were removed from the analysis.

Using the relevant literature, a survey questionnaire was developed to assess the participants' views on four aspects of OAS. The survey questionnaire developed was an adaptation of the SUMI (Software Usability Measurement Inventory) evaluation method. This survey consisted of a 19-item questionnaire dealing with issues related to OAS pertaining to students' and tutors' practice in viewing, manipulating and submitting their work in OAS. A 5-point rating scale was employed and designed for this questionnaire. The 5-point scale provides a sharper focus than with typical 1-to-10 scale rating. To add to the body of data for this study, participants were given opportunities to respond to open-ended questions in addition to pre-coded 5-point ratings. Participants were asked "List the most negative aspect(s) of OAS", "List the most positive aspect (s) of OAS". The survey was conducted via online survey where participants from both courses were informed about the survey through Learning Management System announcements as well as through an email message sent through participant email to remind them about the survey.

### IV. FINDINGS AND RESULTS

One hundred and eighty three participants took part in the study with 132 of them were student participants (ST) and the remaining of 51 participants were tutors participants (TP). The

number of participating tutors (TP) is much smaller than students (SP) due to the nature of the system. The typical student/tutor ratio is 30:1 for each course offered. Thus, one can observe that a higher percentage of students than tutors responded to this survey. Forty-eight percent of the student participants were new to the university (2 semesters or less) and sixty percent of the student participants were experienced computer users. Similar for participating tutors, about 45% were new to the university and 67% rated themselves as experienced computer users. More than 80% of both groups are professionals. Most of student participants have a bachelor's degree or less whereas tutor participants nearly all (96%) have attained a Master's degree or above.

Usability is an important factor for the evaluation of any system and there are many methods for studying usability. One approach was proposed by Kirakowski and Corbett (1993), where the researchers' characterised usability through five different components (that included *efficiency, affect, helpfulness, control* and *learnability*). For this study, the researcher removed the *affect* component but kept the four other components as this component serve no purpose in measuring the intended outcome. Evaluation of the *efficiency, helpfulness, control* and *learnability* of the system, from the perspectives of student and tutor users, were measured from a 16-item questionnaire.

Q1. What differences exist between these two groups regarding *efficiency, helpfulness, control* and *learnability* of the *in-house* built OAS?

To properly evaluate this research question, an independent-Samples T test was employed to compare between the student group and tutor group, assuming 95% confidence level. SPSS 19.0 was used in analysis the data. The result of the analysis is as follows:

#### *Efficiency*

The result of the *t* test on 4-item questionnaire targeting *efficiency* was shown in Table 2. The table contains three columns of results. SPSS 19.0 calculated *t* value, Sig. (2 tailed) value and the determined statistical result as indicated in the table.

Table 2

Efficiency	Group	Mean (M)	t-test for Equality of Means		
			t	Sig. (2-tailed)	Result
Reading characters on the screen (1 Hard _____ 5 Easy)	SP	3.72	-2.563	0.011	Reject H <sub>0</sub>
	TP	4.10			
Performing tasks is straightforward (1 Never _____ 5 Always)	SP	3.70	-2.336	0.021	Reject H <sub>0</sub>
	TP	4.08			
OAS accessibility (1 Unreliable _____ 5 Reliable)	SP	3.50	-1.477	0.141	Fail to reject H <sub>0</sub>
	TP	3.73			
Overall impression on OAS (1 Terrible _____ 5 Excellent)	SP	3.45	-3.031	0.003	Reject H <sub>0</sub>
	TP	3.86			
<b>Overall Efficiency</b>			-2.108	0.036	Reject H <sub>0</sub>

Overall, TP responses were generally more positive than SP on the average mean. Particularly, TP reported reading characters on the OAS screen were easy (M, 4.1), performing tasks is straightforward (M, 4.08), OAS accessibility was quite reliable (M, 3.73) compared to the SP. The result of the *t* test on this component revealed that three-items shown Sig. (2-tailed) value was less than .05, ( $p < .05$ ) at normally specified alpha level. Consequently, the statistically significant

difference were found between the reading characters on the screen, performing tasks is straightforward and overall rating between TP and SP. The means of both items indicated that there are reasons to believe that tutors reported more positively on these items. However, in terms of accessibility there were no significant differences between TP and SP. The overall average mean for efficiency, statically suggests that TP have greater positive views than SP.

### Helpfulness

The results of the *t* test on the 4-items questionnaire targeting *helpfulness* is shown as Table 3.

Table 3

Helpfulness	Group	Mean (M)	t-test for Equality of Means		
			t	Sig. (2-tailed)	Result
Error/Alert messages (1 Unhelpful _____ 5 Helpful)	SP	3.69	0.018	0.985	Fail to reject H <sub>0</sub>
	TP	3.69			
Tailored for my needs (1 Never _____ 5 always)	SP	3.38	-1.324	0.187	Fail to reject H <sub>0</sub>
	TP	3.61			
ITS Helpdesk / Support (1 Unhelpful _____ 5 Helpful)	SP	3.01	-4.703	0.000	Reject H <sub>0</sub>
	TP	3.78			
Overall impression on OAS (1 Frustrating _____ 5 Satisfying)	SP	3.53	-0.251	0.802	Fail to reject H <sub>0</sub>
	TP	3.57			
<b>Overall Helpfulness</b>			-1.661	0.230	Fail to reject H <sub>0</sub>

Again, overall the mean score for TP were more positive than SP on 3 of the items on this component. Both TP and SP have similar scores regarding perceived helpfulness of error/alert messages on the OAS (M, 3.69). In term of *t* test, only one item was proved to be statistically significant. This item was the perceived helpfulness provided by the ITS Helpdesk and Support. The finding suggests that SP think ITS Helpdesk were less helpful when compared to TP, with (2-tailed) value is less than .05, ( $p < .05$ ). The rest of the items in this component were not significantly different between TP and SP. In terms of overall helpfulness, there is no difference between TP and SP.

### Control

Table 4 shows the statistical results of the *t* test on the 4-items questionnaire targeting perceived *control* in OAS.

Table 4

Control	Group	Mean (M)	t-test for Equality of Means		
			t	Sig. (2-tailed)	Result
Uploading & downloading (1 Difficult _____ 5 Easy)	SP	3.77	-1.311	0.192	Fail to reject H <sub>0</sub>
	TP	4.00			
OAS speed (1 Too slow _____ 5 Excellent)	SP	3.36	0.900	0.369	Fail to reject H <sub>0</sub>
	TP	3.20			
Revise mistakes (1 Difficult _____ 5 Easy)	SP	<b>2.89*</b>	1.464	0.145	Fail to reject H <sub>0</sub>
	TP	3.02			
Overall impression on OAS (1 Rigid _____ 5 Flexible)	SP	<b>2.86*</b>	-3.09	0.002	Reject H <sub>0</sub>
	TP	3.43			
<b>Overall Control</b>			-1.27	0.110	Fail to reject H <sub>0</sub>

\*denote negative (-) view

In terms of the *control* component, SP reported higher (M, 3.36) with regards to the speed of the OAS than the TP (M, 3.2). Regarding the issue of control in revising mistakes, upload/download and overall impression, TP rated OAS much

more positively than SP. Two important observations from the results suggest that SP perceived OAS is rigid and revising mistakes in OAS was reported as much more difficult with mean scores 2.86 and 2.89, respectively (Note: mean score that  $< 3$  is considered to be a *negative* reaction.). The result of the *t* test on this component revealed there is a difference in perception of the system in terms of *flexibility* in controlling the system. As indicated from the mean score, the item inquiring about ease of revise mistake was rated negatively by SP, however, there is no statistical difference between them. In terms of *overall control*, there is no statistical difference between TP and SP. However, as noted from this result, problems associated with the rigidity of the system were quite striking, where students' views of *rigid* to *flexible* were interpreted in terms of the ability to make changes and revise mistakes without needing to send request notes to the course coordinator for permission. Presently, the system does not permit users (either SP or TP) to make changes or make any revisions to submissions and this can only be done with permission from the course coordinator or the Dean.

### Learnability

In order to evaluate the OAS against the objective of *learnability*, a 4-item questionnaire was developed to assess participants' perceptions of how easy it was to learn and use the OAS. In particularly, the survey questionnaire asked the participants to rate how easy for them to learn this OAS rating from 1-being difficult and 5-being easy. The results of the *t* test and the compared mean on the 4-items questionnaire on perceived *learnability* was shown as Table 5

Table 5

Learnability	Group	Mean (M)	t-test for Equality of Means		
			t	Sig. (2-tailed)	Result
Learning to use the OAS (1 Difficult _____ 5 Easy)	SP	3.86	-1.863	0.064	Fail to reject H <sub>0</sub>
	TP	4.14			
Exploring the features (1 Difficult _____ 5 Easy)	SP	3.76	-1.261	0.209	Fail to reject H <sub>0</sub>
	TP	3.94			
User Guides & Rules (1 Unhelpful _____ 5 Helpful)	SP	3.54	-2.343	0.02	Reject H <sub>0</sub>
	TP	3.92			
Overall impression on OAS (1 Difficult _____ 5 Easy)	SP	3.92	-0.951	0.343	Fail to reject H <sub>0</sub>
	TP	4.06			
<b>Overall Learnability</b>			-1.27	0.110	Fail to reject H <sub>0</sub>

Again, TP responses were more positive than SP on all 4-items of this component. Particularly, TP perceived learning to use the OAS as quite easy (M, 4.06), quite easy to explore the features (M, 3.94) and quite helpful user guides were provided for them (M, 3.92) compared to their counterparts (SP). From the statistical analysis on *t* test, three-items show no statistical difference between ST and TP. However, only one item, regarding *User Guides and Rules*, a statistically significant difference was found between the TP and SP. There is reason to believe that TP perceived user guides and rules provided are much more helpful and easy to learn than did the SP. Yet, on the overall average mean for *learnability*, no statistical difference between TP and SP was observed. In this account, the user guides that provided for students and tutors are all the same type of documents and information.

Q2. What are the perceived positive and negative aspects of the *in-house* built OAS?

From the survey questionnaire, open-ended questions were added to add value to the quantitative data. Students and tutors were asked to comment what were the perceived positive and negative of OAS.

TP and SP positive responses generally commented that the system is straightforward, easy to learn, user friendly, accessible and saves time. The ability of the auto-grading feature was appreciated by the tutors. Students were pleased to no longer need to personally visit the regional office to submit their assignments. However, the principal negative concerns of both students and tutors fell into two categories. First of all, the system is not flexible enough to meet the requirements of end-users. In particular, any correction or revision of submission must go through course coordinators for approval, or they need to seek assistance from ITS support, which poses inconveniences for end-users because they need to call or email respective course coordinators about any minor mistake in submission of assignment. The second criticism is that TP and SP both perceived that uploading files on OAS takes too long especially during the peak assignment submission deadline period. Comments from SP also noted that the OAS's display and layout needs to be upgraded or re-modeled to be livelier, that the current layout is not appealing.

Most of them would like the system to be more *flexible* in the sense that it allows making changes without the need to obtain many layers of approval, increase the size for submitted file and upload speed, redesign the interface to be more attractive to users and automated prompt system for reminding of student deadlines and marking of assignments (for tutors) via sms or email. Specifically, SP would like to have the functionality to retrieve achieved folders of submitted assignments from previous semester, to use or to view for reference. TP think that feedback should be in both directions as presently *TP can write feedback to SP* but there is no option for SP to respond. It might be a good idea to add a feedback column on OAS where students can write regarding the feedback from the tutors.

## V. DISCUSSION AND PRACTICAL IMPLICATIONS

The *in-house* built OAS is a tool that allows students to submit assignments and permits tutors to upload marks and grades over the internet. Although it is not an automated marking system, it does automatically convert the entered marks into grades. Students can retrieve grades and marked assignments anywhere and anytime. The participants' responses to the study survey on perceived *efficiency*, *helpfulness*, *control* and *learnability* of OAS were generally favourable. Most of the participants were new to the University (47%, 2 semesters or less), it was noted that the general feedback regarding the OAS was generally quite positive (average mean scored ranged from 2.86 to 4.06, the control component SP scored 2.86, the least positive) where 5-being the most positive response and 1-being the most negative response. The favourable feedback might be partially due to the fact that the majority of these participants were experienced computer users (62%, computer literacy), thus one might

expect the users feel that computer mediated approaches are comfortable.

Comparing between the two groups of participants, the overall statistically significant differences were found on perceived the *efficiency* component. However, no statistically significant differences were found on perceived *helpfulness*, *control* and *learnability* between tutor and student participants. On a macroscopic level, the implication from the results suggests that tutors (for this study) have a better and much more positive view of OAS regarding efficiency. Specifically, the tutors' positive responses were that reading the characters on the screen is much easier, performing tasks is quite straightforward and considered it quite excellent compared to students. There is reason to re-examine OAS in terms of efficiency, especially since students rated OAS less efficient than tutors. Although the overall results on *helpfulness*, *control* and *learnability* between tutors and students participants do not suggest any statistical differences between them, when examining individual items from those three components, results did raised some concerns about the following aspects:

- perceived of *helpfulness* in term of ITS helpdesk support,
- perceived of *control* in term of flexible and revise mistake;
- Perceived of *learnability* in term of User Guides & rules

Students perceived the ITS helpdesk and support less helpful (M, 3.01) than tutors (M, 3.78) which can partly be explained by the lack of ITS staffing. Hence, all technical inquiries (including OAS inquires) might take a longer time to resolve which might create dissatisfaction from the users. In terms of the control component, the student group seem to dislike what they perceive as inflexibility in the system, which it seems, is mostly due to the inability to revise mistakes easily (M, 2.89). The indications of inflexibility also exhibited in Q3 as most of the negative reports about the OAS were about the issue of flexibility. For example, numerous remarks sounded like this:

*"There are inflexible re-log-in after log-out. (have to follow certain procedure)."*

*"Once submitted cannot recall for revise."*

*"take time to upload, rigid, not flexible"*

Presently, the OAS disallows any changes once submitted on the OAS to prevent any such unscrupulous act from students. However, only with the approval from the respective course coordinators or the Dean, students or tutors are then allows to make changes, which imposed some inconveniences especially for really minor or unintentional mistakes during submission. The result provided an indication for the institutional to re-examine the quality assurance policy. In terms of User Guides & rules, tutors seem have much appreciation for the user guides compared to the students, however it was not alarming as the overall *learnability* rating was quite positive by both tutors (M, 4.06) and students (M, 3.92).

## VI. CONCLUSIONS

The rapid development of the internet and increasingly sophisticated software capabilities has indirectly impacted the dynamics of distance learning (e-learning) on many levels. Distance learning tools are undergoing re-design by software developers to meet current e-learners expectations and to improve effectiveness to create better capabilities. As the results from this study on *in-house* built online assignment submission system have illustrated, the perceived *efficiency*, *helpfulness*, *control* and *learnability* of the tool is very much contextual and depends on different uncounted or unknown factors. To properly evaluate the OAS tool, it required feedback from the 'real' end-users to provide inputs into further improvement. Nonetheless, students and tutors participating in the survey provided valuable insight *into in-house* built OAS's practices and issues.

In conclusion, the results indicate that overall, students and tutors perceive OAS to be quite *positive* that accounted on the aspects of *efficiency*, *helpfulness*, *control* and *learnability*. Overall impressions were found to be relatively positive especially the key reported items such that performing tasks is straightforward, easy to learn, accessible and the system saves time. Because distance education is becoming more popular and acceptable to mainstream education, especially in developing countries such as Malaysia, the widespread use of online assignment submission systems seem to be an appropriate and cost-effective solution to remote and adult learners. Criticism and some principal of concerns expressed were found regarding the issue of flexibility and the issue of long uploading times. Both students and tutors would like to be given more control to make certain changes (such as wrongful submissions) without the need to obtain layers of approval. Increases in upload speed with larger file spaces would definitely reduce the time to upload assignments. Another perceived drawback identified from the end-users was that the "plain and unattractive" layout needs an upgrade. Students' feedback quoted that "*the interface too plain*", "*everything seems too cramp together*", "*To many wording in the in the OAS web page.*" and "*Maybe the graphic/or back ground need some improvement and not too dull*" Although most research on similar topics does not emphasise aesthetics student input, it does provide an indication there may be a need to look into the matter when designing or redesigning the tool. The study provides an initial research model that may be expanded and generalised for similar future studies about the evaluation of online submission tools. This study is also one of the few studies that evaluate the *usability* from the four dimensions of *efficiency*, *helpfulness*, *control* and *learnability* that potentially affect end-users experiences in the distance learning environment. Although the limitations of a simple study like this cannot prove "causality", this study did show evidence that in designing online submission tools in the distance education environment, there are indeed potential factors for consideration which the developers or the institutions should think about before designing and deploying a similar system:

- Carefully consider the needs of *all* involved end-users
- Provide as much flexibility and accessibility as possible while assuring quality and safety remain intact

- Provide sufficient support (from ITS personnel) and training for end-users in terms of the application use

The OAS has fully replaced the manual submission system since 2007 and has proved to be very successful; however, this study has shown and provided some insight about the needs of the system regarding for further improvement to meet the expectations and requirements of the end-users.

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