The Level of Asynchronous Online Discussion (AOD) Usage among Undergraduates

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Abstract: This paper describes the degree to which undergraduates use asynchronous online discussion (AOD) in the learning process. This study was carried out on academic semester 1 2012/2013 in Universiti Putra Malaysia. The design of the study was in the form of a survey using a five point likert scale questionnaire. The questionnaire consisted of 13 items that were divided into two sub-sections to measure the AOD usage in terms of volume and frequency. Findings show that, majority of the undergraduates self-reported moderate level of AOD usage.

Key words: Communication • Computer mediated communication • Asynchronous online discussion

INTRODUCTION

The role of lecturers and students has changed [1] since the existence of Information and Communication Technology (ICT). The growth of Internet and its outspread utilization in teaching and learning process prompt to the new pedagogical approach such as e-learning [2]. E-learning comprises all forms of technology based instructional delivery mechanism [2; 1] and includes media in the form of text, image, animation, streaming video and audio [2]. One of the greatest advantages of e-learning is it can support more students in the teaching and learning process [2; 3] and also makes learning process more accessible, convenient, flexible and mobile [3]. Besides that, by implementing e-learning in higher educational institutions the graduates are expected to become more responsible, independent and competitive in the international arena [4].

In order to learn effectively, students should do more than just listening [5]. The success of the educational process does rely on the effective communication and interaction that occurs between the lecturers and students; and among students [6; 7]. Similarly, [8] stated that the effectiveness of educational process depends on lecturers’ interaction with students, communication among students and how these students communicate with their learning material. Hence, student discussion is a crucial element in the interactive e-learning environment [9-12].

Effective communication depends on the utilization of modern communications technologies [6]. The medium used for communication has evolved from face-to-face to computer-mediated-communication or also known as CMC. Recent years had seen the increasing use of CMC [13; 14] due to the tremendous popularity of the Internet. This method of communication can be categorized as either synchronous or asynchronous. Research shows that majority of the online communities are using asynchronous CMC compared to synchronous CMC [15; 16; 17]. The main drawback of synchronous CMC is that students are not able to participate at the same time due to schedule and time constraints [18].

Asynchronous online discussion (AOD) is defined as “a text-based human-to-human communication via computer networks that provides a platform for the participants to interact with one another to exchange ideas, insights and personal experiences” [19, p. 249]. The tools supported asynchronous CMC include fax, email,
mailing list, calendar, survey and pools, internet bulletin, discussion boards, list-servers, newsgroups, forums, announcement, blackboard documents, wikis, blog and social networking sites (such as Facebook, Twitter, etc) [7, 13, 18, 20-26].

June 9, 2014 There are various successful use of AOD in education that have been reported by researchers all over the world [27]. Among the strengths of using AOD for teaching and learning purposes are as follows:

- Creating flexible learning environment [15, 27-30].
- The information can distribute immediately and faster compare to the traditional classroom approach [29].
- Encourage critical thinking [14; 10; 31; 32; 11; 33].
- Construct new knowledge [15; 14; 10; 27-29; 32-35] by promoting better cognitive and exploratory learning [27; 14; 10].
- Promote deeper understanding [9, 15; 27-29; 31 34, 36], thus students perform better in academic [34; 15; 10; 33] and improve learning skills [15; 14; 10].
- Suitable for shy students, because AOD reduces the feeling of isolation [15; 9; 10; 33].
- Foster collaborative learning [35; 27; 15; 14; 28; 9; 5; 33] by increasing student-to-student discussion and cooperation [10].
- An excellent platform to exchange ideas and experiences [35; 27; 15; 14; 31].
- AOD is learner-centered, where every student who are actively involve will gain benefit such as self-motivated, self-directed, inquisitive and innovative [27; 28] and boosted their self-esteem [27; 31].

Problem Statement: Students’ involvements are crucial in order for discussion activity to be successful [36; 10]. However, communication among students is more complicated to support [33]. Undoubtedly, even though AOD is available all the time, it does not mean students will use it effectively [10] and participate actively [37]. Problem occurs when there is only little participation in the AOD because students do not actively participate in technology related innovation [38]. Students usually posted one message only and never participated again; hence no further communication occurs [33]. Understanding how to promote student contribution in AOD has become increasingly crucial [31]. Therefore, the purpose of this study was to determine the level of AOD usage in the learning process among undergraduates in UPM.

Objective of the Study: The main objective of this study is to identify the degree to which undergraduates used AOD in learning process.

Theoretical Framework: This study adopted three Technology Acceptance Model (TAM) variables namely perceived ease of use, perceived usefulness and attitude towards using computer system. Past studies revealed that perceived ease of use influence computer technology usage through two variables namely, perceived usefulness [39; 40; 42; 43], attitude [44]. Similarly, perceived usefulness is identified as one of the determinants that directly influence technology usage [39; 40; 42; 45; 43]. Furthermore, study by [46] found perceived usefulness as the key factor in determining the attitude towards technology usage. In addition, attitude towards technology is identified as one of the factors that determine the successful utilization of technology [47; 48; 49; 50; 51; 52; 53]. Moreover, research studies have shown clearly that students faced technological, personal and social barrier in online education [54; 55; 56; 57; 58; 59]. Therefore, the TAM has provided a theoretical based, jointly with other external variable in examining the factors influencing the use of AOD among undergraduates in learning process.

MATERIALS AND METHODS

Research Design: A descriptive-correlational research design was used in this study. It is a combination of two non-experimental quantitative statistics which is descriptive and inferential statistics (in this case, correlational research design). A descriptive-correlational research design is the pertinent approach in order to achieve the objective of this study.

Population and Sample: This study was conducted during the first semester 2012/2013 in UPM Serdang campus. Only four faculties were involved in the study as granted by the Academic Division. These faculties were drawn by using fishbowl random sampling technique where three faculties from the science field (Faculty of Medicine and Health Sciences, Faculty of Science and Faculty of Computer Science and Information Technology) and one faculty from the social science field (Faculty of Human Ecology) were selected. These faculties represent the ratio of faculties in UPM where 12 sciences faculties and only 4 social sciences faculties (12:4). As for the population of study, only
undergraduates semester 3 and above were selected. This was because they were assumed to be exposed to online learning for at least two semesters. Therefore, the population for this study was 2770 undergraduates.

This study primarily applied the five-point Likert scale to measure continuous data. Therefore, as recommended by [60], Cochran’s formula was used to identify the sample size if the research uses continuous scale to collect data [60]. As a result, the required sample size calculated based on Cochran’s formula was 267. Since the calculated sample size was exceeding 5% of the population, the Cochran’s correction formula (1977) was used to determine the accurate sample size. As a result, the actual sample size as calculated based on Cochran’s correction formula was 244. Oversampling method was applied in order to overcome the sampling error [61]. As stated by [62], it is advisable to increase up to 50% of sample size because the response rate is typically less than the target sample [62]. Thus, the drawn sample size after increases up to 50% was 366.

The sample of this study was selected using randomized proportional stratified cluster sampling. About 370 questionnaires were printed and distributed among undergraduates, but only 313 were returned.

**Instrumentation:** The instrument used in this study was a set of questionnaire. The questionnaire was divided into two sections (Section 1 and Section 2). Section 1 was designed to collect some basic information about undergraduates’ background. Section 2 was intended to survey the use of AOD in learning process. The level of AOD usage was operationally defined as the undergraduates’ self-reported measure of AOD usage in terms of frequency and volume for the purpose of learning process. This scale was developed by the researcher to measure the use of AOD among undergraduates in learning process. It consisted of 13 items that were divided into two sub-sections. The instrument was administered in English and Malay language because UPM uses both languages as the medium of teaching and learning process.

**Validity and Reliability:** The questionnaire was evaluated and established based on content validity to guarantee that every item used is precise for the research and the subjects [63]. In the direction of ensuring content validity, a panel of three experts was chosen from Universiti Pendidikan Sultan Idris (UPSI), Universiti Kebangsaan Malaysia (UKM) and Universiti Putra Malaysia (UPM). As a result, the items only had minor amendment and alteration. Therefore, the content validity of all the items used in the questionnaire was entirely verified and established. After the content validity process had been accomplished, the questionnaire was retained for the pilot test to test on reliability.

The pilot test was conducted on 40 undergraduates in UPM. All of the respondents were randomly selected and not involved in the actual study. All of the respondents were semester 3 and above students. The pilot test involved four randomly selected faculties, where one from Social Science faculty (Faculty of Educational Studies) and three from Sciences faculties (namely Faculty of Biotechnology and Biomolecular Sciences, Faculty of Agriculture and Food Sciences and Faculty of Food Science and Technology). There were ten undergraduates from each faculty involved in this study.

Table 1 illustrated the reliability value obtained from pilot test and actual study. The acceptable Cronbach’s alpha value of a scale instrument should above .70 [64]. As a result, this instrument had good internal consistency because all alpha level of the scales was greater than .70.

**Data Analysis:** Data transformation was carried out in order to explain the level of AOD usage in this study. Data transformation was crucial with regard to categorize the scores obtained from the respondents in three categories which are high, moderate or low. The four step needed to be completed were determine the minimum and maximum score for the scale, identify the range, calculating the class interval and arranging the scores into categories.

Out of 313 returned questionnaires, only 269 were analyzed. The rest were excluded due to reasons such as never utilized the AOD in any of the courses, missing values and extreme outlier. Descriptive statistics were used to report and describe the level of AOD usage among undergraduates.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Internal Reliability of Pilot Study (n=40)</th>
<th>Internal Reliability of Actual Study (n=269)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of AOD in Learning Process</td>
<td>.86</td>
<td>.76</td>
</tr>
<tr>
<td>• Volume of use</td>
<td>.73</td>
<td>.73</td>
</tr>
<tr>
<td>• Frequency of use</td>
<td>.86</td>
<td>.71</td>
</tr>
</tbody>
</table>
RESULTS AND DISCUSSION

The level of AOD usage was measured using 13 items. The possible scores for this variable was categorized into three levels ranging from 13 to 65. The scores ranging from 13 to 29 was categorized as low AOD usage, scores between 30 to 46 as moderate AOD usage and the scores above 47 as high AOD usage. Table 2 portrays the level of AOD usage as reported by the undergraduates. The findings revealed that the majority of undergraduates (n=184; 68.4%) self-reported a moderate level of AOD usage. The remaining 30.48% (n= 82) undergraduates were high level AOD users. Only 1.12% (n= 3) undergraduates considered themselves as low level AOD users.

The use of AOD scale composed of two sub-scales which measured the volume and frequency of AOD usage. The volume of the AOD use was translated into mean scores on a 5-point scale ranging from 1 to 5. The descriptive analysis reveals that majority of the undergraduates (46.8%) have been using AOD more than three semesters. The vast majority of the undergraduates utilize AOD for 1 – 3 hours on daily basis (72.9%), more than 9 hours on weekly basis (27.50%) and more than 9 hours per semester (61.70%). On the other hand, over half of the undergraduates (57.6%) spend 10 – 30 minutes for each discussion per visit. Moreover, almost a quarter of the respondents (22.3%) spend 40 – 30 minutes for each discussion per visit. The percentage differences between scales for duration to learnt about AOD environment individually was slightly small. The percentage of the respondents who spend 1 – 2 hours/semester to learn about AOD environment (29.4%) was found almost equal with the undergraduates who spend less than 1 hour/semester to learn about AOD environment (28.6%).

Table 3 presents the percentage distribution of the undergraduates by degree of agreement on 7 items regarding their frequency of utilizing the AOD. It is obvious from this table that the highest mean scores were achieved in the utilization of the Social Networking Sites (M= 4.66, SD=0.605), whereby 95.5% of the undergraduates used the Social Networking Sites (eg. Facebook, Twitter, etc) either often or always in learning process. The second highest scores with M=3.88 and SD=0.939 goes to the utilization of Email, whereby 65.8% of the undergraduates used Email either often or always. The utilization of Wiki achieved scores of M=3.65 (SD=1.095), whereby 63.6% of the respondents used Wiki either often or always. Less than a quarter of the undergraduates used announcement tool (20.1%) and forum (17.1%) in learning process. The lowest two mean scores were recorded for using blog (M=2.48, SD=1.268) and discussion board (M=2.26, SD=1.039) in learning process.

In general, the undergraduates reported a moderate and high level of AOD usage in learning process. The findings indicated that, the undergraduates spend a generous amount of time in using AOD in their learning process. As can be seen the result of this study concurs with other past studies related to the use of AOD among students [13; 18; 20; 21; 7]. It seems that the undergraduates self-reported that they spend a little amount of time per semester to learn about AOD

Table 2: Distribution of self-reported level of AOD usage (n=269)

<table>
<thead>
<tr>
<th>Levels</th>
<th>Score</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>13 - 29</td>
<td>3</td>
<td>1.12</td>
</tr>
<tr>
<td>Moderate</td>
<td>30 - 46</td>
<td>184</td>
<td>68.40</td>
</tr>
<tr>
<td>High</td>
<td>47 - 65</td>
<td>82</td>
<td>30.48</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>42.70</td>
<td>Std Deviation = 6.59</td>
</tr>
</tbody>
</table>

Table 3: Respondents' degree of the AOD usage in terms of frequency

<table>
<thead>
<tr>
<th>Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you use Forum?</td>
<td>17.5</td>
<td>38.7</td>
<td>26.8</td>
<td>11.9</td>
<td>5.2</td>
<td>2.49</td>
<td>1.07</td>
</tr>
<tr>
<td>How often do you use Discussion Board?</td>
<td>26.4</td>
<td>37.2</td>
<td>23.0</td>
<td>11.2</td>
<td>2.2</td>
<td>2.26</td>
<td>1.04</td>
</tr>
<tr>
<td>How often do you use Email?</td>
<td>0.7</td>
<td>6.3</td>
<td>27.1</td>
<td>35.7</td>
<td>30.1</td>
<td>3.88</td>
<td>0.94</td>
</tr>
<tr>
<td>How often do you use Announcement?</td>
<td>21.2</td>
<td>32.0</td>
<td>26.8</td>
<td>14.9</td>
<td>5.2</td>
<td>2.51</td>
<td>1.14</td>
</tr>
<tr>
<td>How often do you use Blog?</td>
<td>30.1</td>
<td>21.6</td>
<td>27.1</td>
<td>13.0</td>
<td>8.2</td>
<td>2.48</td>
<td>1.27</td>
</tr>
<tr>
<td>How often do you use Wiki?</td>
<td>4.8</td>
<td>11.5</td>
<td>20.1</td>
<td>41.3</td>
<td>22.3</td>
<td>3.65</td>
<td>1.10</td>
</tr>
<tr>
<td>How often do you use Social Networking Sites (eg. Facebook, Twitter, etc.)</td>
<td>0.4</td>
<td>0.4</td>
<td>3.7</td>
<td>23.8</td>
<td>71.7</td>
<td>4.66</td>
<td>0.61</td>
</tr>
</tbody>
</table>

1= Never; 2 = Rarely; 3 = Sometimes; 4 = Often; 5 = Always
environment individually. This is because today’s undergraduates were technology literate and Internet savvy. Besides that, the AOD environment itself is user friendly and easy to use thus do not required a lot of time to learn on how to use it.

Social network sites such as Facebook and Twitter are the favourites for the students, followed by the use of emails, wikis, blogs and forums. This finding is supported by [65] who found that the undergraduates in United States had positive perceptions towards Social Networking Sites, thus used logged onto Social Networking Sites more than three times daily. Likewise, [46] found out that students are frequently engaged with social networking sites like Facebook and Twitter. Similarly, [66] revealed that the preferable communication channels among distance students were Social Networking Sites (Facebook), e-mail, discussion boards and live chat.

Since using AOD can encourage critical thinking among the students [14; 10; 31; 32; 11; 33] it can inferred that the undergraduates who are using AOD actively will be led to enhance their thinking process and become critical and creative learners. Using AOD can be very beneficial to students who are less confident and shy [67; 15; 9; 10; 33]. They can learn collaboratively [35; 27; 15; 14; 28; 9; 5; 33] and construct new knowledge in more meaningful ways as postulated by [34; 35; 27; 15; 14; 10; 28; 29; 32; 33].

**CONCLUSION**

Findings of this study revealed that more than 98% of the used AOD from moderate to high level. This finding demonstrates that they utilized AOD for learning purposes compared to the conventional way of learning. Using AOD helps the students to learn more better in a more creative and fun way. It also helps the students to collaborate with others online in order to achieve meaningful educational goals.

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