

Impact of Discussion Forums on the Final Scores of Post Graduate Students at Open University Malaysia

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ABSTRACT

At Open University Malaysia (OUM), online discussions serve as a bridge between the face-to-face and virtual lessons. However, for the Master of Instructional Design and Technology (MIDT), the online discussions are the lifeline of students and facilitators as the discussion forum is a place where high level asynchronous communications are triggered. As such it is important to identify such interactions and determine if there is a significant impact on the final grade achieved by students. In this study, an attempt was made to analyse the discussion forum using the Ning social networking site (<http://hmid6303.ning.com>). A total of 14 students enrolled for the fully online MIDT course offered by OUM. The findings from normality test results (Shapiro-Wilk) indicate that the forum scores were normally distributed (significance value >0.05) and final score shows some deviation from normality (significance value <0.05).

INTRODUCTION

Online discussion forum is pivotal for any teacher who wishes to establish successful asynchronous communication. Asynchronous communication via discussion forums, allow teacher-student interactions and student-student interactions. In order to encourage and motivate student participation in online discussion forums, it has been a practice to allot marks for their contributions. However, it has always been a challenging task for the teacher as to how to measure and scale the quality of the content discussed in the forum. In order to establish effective online communication, students need to be motivated to participate in discussion forums. Such motivation may be stimulated by the use of a Learning Management System (LMS) as a result of improved access to learning materials, the provision of more timely feedback to students through on-line assessment (Breen, Cohen, and Chang, 2003), and improved communication among students and between students and faculty through the availability of bulletin boards, discussion forums and email facilities (Kang, 2001).

LITERATURE REVIEW

With the increase in the use of a Learning Management System (LMS), online discussion forums seem to have gained popularity in capturing the communication process between teacher-student, student-student, and student-teacher. As such, as mentioned by Schrire (2006), understanding the discourse that occurs in online discussion forums in the teaching-learning context requires some methodological approach to measure and analyze the data and information. However an earlier body of research is more positive in its description of online forums on meaningful learning. Specifically, these studies indicated that participation in online forums could lead to broader and deeper participation in group activities (Kiesler, Siefel, & McGuire, 1984; Pullinger, 1986; Spitzer, 1989, as cited in Mazur, 2004). Therefore, it seems important to examine the impact of discussion forms with respect to students final score and look into the various parameters that promote meaningful learning.

Rubrics Based Online Assessment of Discussion Forums

It has been found that Gunawardena et al's (1997) model on knowledge creation and Newman et al's (1996) model on critical thinking, though concerned with qualitatively describing meaningful interactions that promote in-depth learning in online discussions has become irrelevant especially when the discussion forums are to be graded based merely on students' participation or any other metric and not on the basis of knowledge creation or critical thinking. There had been a remarkable number of researches who had implemented rubrics based assessment for assessing online discussion forums geared towards higher-order thinking. For example, Anderson and Krathwohl (2001) developed a rubric based on Bloom's Taxonomy (Table 1). They defined three levels of responses: Low (knowledge and comprehension; Medium (Application and Analysis); and High (Synthesis and Evaluation). A list of processes and behavior oriented descriptors are employed to define the levels of thinking requisite the appropriate level.

Table 1: Rubric for Evaluation of Online Discussion Prompts & Responses.

| Levels of Thinking | Points | Process Verbs & Behavior Descriptors |
|--------------------------------|--------|--|
| Low: Remember or Understand | 1 | Explain, list, describe, recall, define, identify, show, restate, summarize, list, demonstrate, illustrate, explain |
| Medium: Apply or Analyze | 2 | Organize, classify, relate, prioritize, discuss, group, model, apply, compare, contrast, distinguish, categorize, take apart, combine |
| High: Evaluate or Create | 3 | Extend, design, reconstruct, reorganize, create, develop, speculate, propose, predict, generate, interpret, judge, justify, critique, evaluate use criteria, dispute |

(Source: Anderson & Krathwohl, 2001)

Another rubric based assessment for online discussion board participation and levels of thinking was initiated by Palloff and Pratt (2003). In this assessment, various levels of participations are categorized as per Table 2.

Table 2: Levels of Participation

| Score | Level of Participation In One Week |
|-----------|--|
| 0 points | Minimum number of postings not met |
| 7 points | Minimum met; all discussions on Level 1 |
| 8 points | Minimum met; at least one example of discussion above Level 1 |
| 9 points | Minimum met; at least one example of discussion above Level 1 with at least one above Level 2 |
| 10 points | Minimum met; at least two examples of discussion above Level 1 with at least one above Level 3 |

In yet another online assessment, Gilbert and Dabbagh (2005) developed a rubric that awarded a point value to excellent, good, average and poor postings. In addition to the following evaluation criteria, students were required to contribute 5-6 postings over the six-day discussion period and were evaluated thus:

- (a) timely discussion contributions;
- (b) responsiveness to others' postings;
- (c) knowledge and understanding of assigned reading;
- (d) ability to follow the online discussion protocols.

Gilbert and Dabbagh's addition of the online discussion evaluation rubric influenced meaningful discourse and revealed an increase in the number of postings per student when used for assessing asynchronous online discussion forum.

Another assessment rubric for discussion forum was introduced by Palmer, Holt, and Bray (2008), whereby, their recommended analyses included both quantitative (number of postings, length of posting, number of messages read, etc.) and qualitative terms (did the posting exhibit cognitive/social/teaching presence?). They conducted a study using this evaluation technique to investigate the impact of participation in online discussions on student performance. The results indicated that assessing online discussions positively impacted students' participation and final grades. Thus we can see that any models and rubrics based assessment have evolved consistently in use over a period of time to asses online discussions.

Method

In this study, the discussion forums that were analyzed were captured from the Ning portal (<http://hmid6303.ning.com>). This web portal was designed for the subject "Current Trends and Issues in Instructional Technology", which had 14 students enrolled for the fully online Master of Instructional Design and Technology (MIDT) course, offered by Open University Malaysia. Out of the 14 students, there were 5 women and 9 men from different countries. Discussion board participation was worth 20% of the final grade and consisted of discussions on the assigned readings, instructional design topics, and peer-to-peer reviews. The rubrics that were used to assess the online discussion forums

postings were based on the assessment criteria framed by Palloff and Pratt, (2003) and that of Palmer, Holt, and Bray (2008). This is because, the online assessment for this study was completely based on asynchronous mode of communication, which used rubrics to capture the quality of postings contributed in the discussion forum. In this study, the rubrics used were based on the following criteria.

Table 3: Rubrics for This Study

| Criteria for Grading Each Discussion | Rubrics |
|--------------------------------------|---|
| 9-10 PTS | Quality*, consistent and frequent postings (actively posting quality postings) |
| 7-8 PTS | Quality *and some what frequent postings (somewhat actively posting quality postings) |
| 5-6 PTS | Quality * postings (min 2 per forum per person) (posted 2 quality postings) |
| 3-4 PTS | Somewhat quality postings (min 2 per person) (posted 2 "somewhat" quality postings) |
| 1-2 PTS | Poor contribution to the forum |

Note: * Quality postings refer to discussions that were based on student sharing their knowledge, understanding and adoption towards the discussed topic.

Source of Data

Since the main objective of this study was to investigate, if there exists any correlation between the students scores allotted for their contribution in the discussion forum against their final scores for the said course, the main source of data for this study was from the discussion form created using Ning portal (<http://hmid6303.ning.com>). The discussions contributed by the students were based on the book "The World is Open" by Professor Curtis Bonk. The book consisted of 12 chapters, which was referred by the author as "openers". Omitting the introduction chapter, the entire book had 11 openers and the period of assessing the student's contribution in the discussion forum pertaining to each opener began from 11th Jan 2010 until 30th April 2010. The Ning portal, which was designed to capture student's discussions, is shown in the Figure 1.

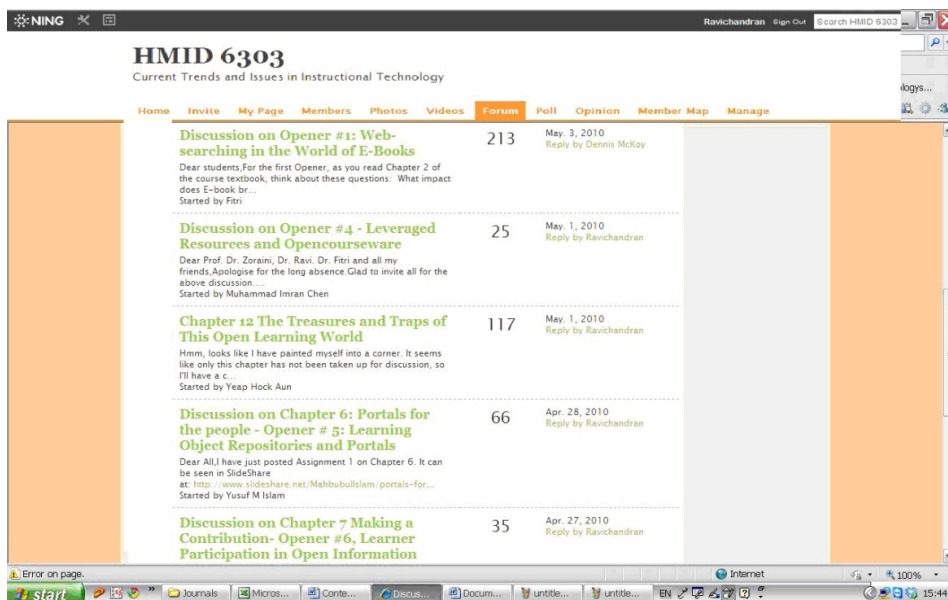


Figure 1: Online discussion forums captured from Ning portal

It was an onerous process in getting the sources of data from the contributions made by students in the discussion forum with respect to the rubrics. Therefore, in order to simply the task and to trace the exact postings made by each student, ignoring those contributions which did not make any sense to the discussion topics, each of the students' postings were tabulated using Case-ordered effects Matrix as shown Table 4.

Table 4: Case-Ordered effects Matrix.

| Quality of postings based on Knowledge*, Understanding*, and Adoption* | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Student 6 | Student 7 | Student 8 | Student No:9 | Student No:10 | Student No:11 | Student No:12 | Student No:13 | Student No:14 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|---------------|---------------|---------------|---------------|---------------|
| ++ Actively contributing quality postings | | | | | | | | | | | | | | |
| + - Some what active posts | | | | | | | | | | | | | | |
| + Minimum 2 postings per forum | | | | | | | | | | | | | | |
| - Minimum 2 Somewhat postings | | | | | | | | | | | | | | |
| -- Poor contribution to the forum | | | | | | | | | | | | | | |

- * Knowledge – Able to express the discussion topic related to subject content.
- * Understanding – Able to express the views to peers on the discussed topic.
- * Adoption – Able to show some valid examples pertaining to the discussed topic.

From the case-ordered effects matrix, it was ease to identify the scoring points of the students with respect to the rubrics. Thus, the final source of data, which was obtained, is tabulated in Table 5.

DISCUSSION

The normality test results (Shapiro-Wilk) indicate that the forum score is normally distributed (significance value >0.05) and final score shows some deviation from normality (significance value <0.05). However, given the small sample size we can assume that the final score is also close to normal distribution.

Table 5: Normality Test Results

| | Shapiro-Wilk | | |
|-------------|--------------|----|--------------|
| | Statistic | df | Significance |
| Forum Score | 0.890 | 14 | 0.081 |
| Final Score | 0.860 | 14 | 0.030 |

Further, the F-test (statistical test used here to measure the overall significance of the regression model) results indicate that the regression model is significant in explaining the variance in the final score using the forum score as the predictor variables, $F(1, 12) = 9.469, p < 0.01$. In addition, the model parameters suggest that the model (using forum score as a predictor) is able to explain 44.1% variance in the final score. The regression coefficient indicates that the final score increases by 1.09% units with each 1% unit increase in the forum score.

Table 5: Final Scores of Students with Respect to Each Opener in the Discussion Forums

| Student | Opener 1 | Opener 2 | Opener 3 | Opener 4 | Opener 5 | Opener 6 | Opener 7 | Opener 8 | Opener 9 | Opener 10 | Opener 11 | Total | 20% Scores |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-------|------------|
| 1 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 5 | 16 | 2.91 |
| 2 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 5 | 12 | 2.18 |
| 3 | 7 | 0 | 0 | 0 | 2 | 5 | 1 | 0 | 0 | 0 | 5 | 20 | 3.64 |
| 4 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 5 | 16 | 2.91 |
| 5 | 10 | 7 | 7 | 0 | 9 | 5 | 9 | 7 | 0 | 2 | 9 | 65 | 11.82 |
| 6 | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 9 | 20 | 3.64 |
| 7 | 10 | 8 | 7 | 0 | 9 | 5 | 9 | 7 | 0 | 8 | 6 | 69 | 12.55 |
| 8 | 4 | 0 | 5 | 0 | 4 | 0 | 0 | 0 | 0 | 9 | 6 | 28 | 5.09 |
| 9 | 8 | 7 | 3 | 0 | 0 | 5 | 0 | 1 | 0 | 10 | 7 | 41 | 7.45 |
| 10 | 5 | 3 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 17 | 3.09 |
| 11 | 7 | 7 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 10 | 0 | 33 | 6.00 |
| 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.18 |
| 13 | 9 | 7 | 5 | 0 | 9 | 0 | 1 | 5 | 0 | 8 | 5 | 49 | 8.91 |
| 14 | 5 | 2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 2.55 |

After the discussion forum marks were calculated, the final percentages of marks scored by the students for the said course were obtained from the respective facilitators.

Table 6: Percentage of Marks in the Course and the Discussion Forum.

| Student No | Final Course Marks (%) | Discussion Forum Marks (%) |
|------------|------------------------|----------------------------|
| 1 | 62.91 | 14.55 |
| 2 | 2.18 | 10.9 |
| 3 | 78.64 | 18.2 |
| 4 | 29.91 | 14.55 |
| 5 | 85.82 | 59.1 |
| 6 | 69.64 | 18.2 |
| 7 | 85.55 | 62.75 |
| 8 | 17.09 | 25.45 |
| 9 | 74.45 | 37.25 |
| 10 | 33.09 | 15.45 |
| 11 | 62 | 30 |
| 12 | 0.18 | 0.9 |
| 13 | 72.91 | 44.55 |
| 14 | 69.55 | 12.75 |

SUMMARY

The F-test results from this study, indicates that the regression model is significant in explaining the variance in the final score using the forum score as the predictor variables, $F(1, 12) = 9.469, p < 0.01$. This surmounts the findings of Palmer, Holt & Bray, (2008), who conducted a study using evaluation technique to investigate the impact of participation in online discussions on student performance. Their study results indicated that assessing online discussions positively impacted students' participation and final grade.

The normality test results from this study indicates that the forum score is normally distributed (significance value > 0.05) and the final score shows some deviation from normality (significance value < 0.05). However, given the small sample size we can assume that the final score is also close to normal distribution. This is because, regarding group size, a study made by collaborative researcher, found that there was no difference in the quality and depth of discussions between a small and large group listserv discussion (Toci, 1997). Therefore the study regression model, which shows $\text{FINAL SCORE} = 1.09 * (\text{FORUM SCORE}) + 24.81$, can also be used as a key indicator for online facilitators, to identify the relation between the online discussion forum scores and the final scores. That is, the regression coefficient indicates that the final score increases by 1.09% units with each 1% unit increase in the forum score. Also the predicted final score and the error associated with the regression model shows significant deviation, that is, the results indicate that the error associated with 50% of the respondents is greater than 20%.

CONCLUSION

The success of any online course relies on how efficiently the facilitators anchor the discussion forum to bring in meaningful and quality discussions. In order to assess the online discussions, facilitators use many methods, either qualitative or quantitative assessment methods. While quantitative assessment on discussion forums are widely used, it becomes imperative to use qualitative assessment, as in-depth content analysis techniques in the form of rubrics can be used to capture the actual quality of postings. This study showed a significant correlation between the discussion forum postings against the final score of the students. That is, $\text{FINAL SCORE} = 1.09 * (\text{FORUM SCORE}) + 24.81$. Further, the regression model is significant in explaining the variance in the final score using the forum score as the predictor variables. Also the regression model shows significant deviation, that is, the result indicates that the error associated with 50% of the respondents is greater than 20%. Although this study captures findings on rubric-based discussion forum assessment, the sequence of content analysis techniques that were used seems to make this study very unique.

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