

Students' Interaction in the Online Learning Management Systems: A Comparative Study of Undergraduate and Postgraduate Courses

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Abstract

The quality of interaction between learners and online content is one of the imperative factors in determining the efficacy of web-based teaching-learning towards the creation and maintenance of sustainable learning communities. Interaction with content is an internal dialogue of reflective thought that occurs between learner and the substance. Interaction is often triggered and supported by events in the learning environment – focusing on how the learner interacts with what is to be learned.

This paper looks at the difference in learners' interaction on the online Learning Management System (LMS) of undergraduate and postgraduate courses. Based on a framework developed for investigating learners' interaction with online content in Wawasan Open University, data from the LMS log and activity database was extracted. The data is then analyzed based on the pattern and behavior of learners' interaction with the online content of the courses. Further analysis is done by transcribing the discussions and exchanges of teacher and learners within the online forums, specifically investigating the dimension, depth and category of exchanges that occurred. Based on the findings, several recommendations are made to enhance the design and delivery of web-based content, aiming at maximizing the efficacy of the online learning environment of undergraduate and postgraduate courses in open distance learning (ODL).

Keywords: *Learning Management System (LMS), learners' interaction, online content, online forums, web-based resources*

Introduction

Education is one of the crucial transformation pillars for human capital development. In order to fulfill social agenda and broaden the tertiary education opportunities in promoting lifelong learning, open distance learning (ODL) has emerged as a trend in Malaysia. The education sector has experienced a significant shift as it enters into a new era of online learning. High quality and effectiveness of ODL, particularly adult teaching-learning in tertiary education, has become one of the crucial determinants to realize the country's goals and agenda in today's knowledge economy. Open distance education institutions in Asia and worldwide are facing vast changes brought by the increasing availability and sophistication of information and communication technologies (ICT), as well as the way these technologies are impacting the delivery of ODE programs (Murphy, Walker & Webb, 2001).

Following the rapid development of open distance education and the vast online resources made available by the Internet and Learning Management Systems (LMS), the quality of interaction between learner and web-based content is one of the imperative factors in determining the efficacy of online teaching and learning (Anderson, Rourke, Garrison & Archer, 2001; Kidd, 2005; Lim & Lee, 2007; Grant & Thornton, 2007) towards the creation and maintenance of sustainable learning communities. Interaction with content is an internal dialogue of reflective thought that occurs between learner and the material. Interaction is often triggered and supported

Background of Wawasan Open University (WOU)

Penang-based Wawasan (Vision) Open University (WOU) is Malaysia's first private and not-for-profit open university dedicated to (working) adult learners through the ODL mode. WOU opened its doors to the first batch of learners in January 2007. By the January 2010 semester, there were a total of 5,466 learners who had experienced the WOU system. The university currently offers 22 undergraduate and 3 postgraduate programs at its six regional learning centers throughout the country. WOU aspires to be a vibrant learning community that inspires learning, supports innovation and nurtures all-round personal growth, and commits to the expansion of opportunities in higher education and to teaching excellence aimed at increasing the level of knowledge and scholarship among all Malaysians. WOU believes in upholding high institutional standards, celebrating the diversity of its students, recognizing its employees, valuing citizens and the community, as well as practicing academic freedom and fairness.

The WOU model of delivering open distance education involves the interplay of several key components, i.e. course materials and learner support system, assessment, open entry admission system, flexible progression pathways, multiple exit points and external peer review. The concept of ODL entails educational training and instruction that does not require a student to be physically present for classes at all times. The learning process is instead achieved through content that is transmitted electronically, over the telephone, by teleconferencing, and print/multimedia materials. In WOU's technology enhanced ODL approach, the role of conventional lectures is replaced by a set of comprehensive self-contained course materials (including textbooks) provided either in print or CD form. WOU provides learner support consisting of: (i) Tutors - part-time academics with relevant subject expertise who assist students in their studies through a number of two-hour face-to-face tutorials conducted once every 4-5 weeks at the local learning centers; (ii) Telephone consultation by tutors; (iii) Online learning support on a 24×7 basis via *WawasanLearn* – a LMS based on the open-source system called Moodle that enables learners to access supplementary materials, online quizzes, and forum discussions with teachers and peers; (iv) Extensive electronic library resources; as well as (v) The staff and facilities of the WOU Regional Offices, which are equipped with computer labs, libraries and free access computer terminals. The mastery of the learning outcomes of courses is evaluated via an assessment strategy that consists of a number of assignments (40% or 50%) and a proctored final examination (50% or 60%).

Literature Review and Research Questions

Many researchers have focused on instructional considerations in response to the need to plan, design and deliver distance and/or online courses. The analysis of an open distance learner's interaction with online content and online forums in the web-based learning environment is viewed as an area worth exploring. This is aimed at discovering strategies to address the needs for undergraduate and postgraduate learners based on their learning behavior in the virtual environment.

Moore (1989) categorized learner-content interaction to three types, namely learner-content interaction, learner-instructor interaction, and learner-learner interaction. Learner's interaction with content is an important feature of education as it helps in clarifying the learner's understanding of the subject matter and even to generate knowledge (Moore, 1989). Collins and Berge (1996) highlighted that learners tend to combine the new knowledge acquired by

interacting with content with their prior knowledge on that subject matter. Hence, interaction can be synthesized as an active process which requires learners to do more than passively absorb information. Increased interaction can improve learner motivation, achievement, and attitude toward learning (Hillman, Willis, & Gunawardena, 1994). According to social constructivist theory, learning environments that encourage active participation, interaction and dialogue provide students with opportunities to engage in a process of knowledge construction as they try to create meaning from new experiences (Jonassen, Davison, Collins, Campbell, & Bannan Haag, 1995).

In addition, Hillman et al. (1994) argued that intervening technologies enable learners to communicate with the content as well as interact with teachers and other learners. In fact, technologies that deliver instruction to distance learners are often classified as two-way interactive or one-way non-interactive (Bates, 1995). It is crucial that teachers encourage learners to interact with the subject matter aiming at constructing new knowledge in the learning process (Moore & Kearsley, 1996). Oliver, Omari & Herrington (1997) explored the learner interaction in the online learning environment, focusing on the social, procedural, expository and cognitive dimensions.

Learners' interaction with the online content – comprising of web-based resources and the interaction in forum discussions within the online learning environment – were investigated based on a variety of literature in the related research area. These include the model of interaction by Moore (1986) and the dimensions of exchanges by Oliver and McLoughlin (1997). Researchers commonly use primary data gathering techniques, such as questionnaires and interviews, to obtain data on learners' interaction with printed materials and/or learners' experience/perception of an online course. However, as learners' interaction with online content increases, it is crucial to obtain actual feedback to assess the usefulness of the online materials as well as the exchanges that occur in the online discussion forums. A recent study in the United Kingdom by Joffoate (2010) indicated that postgraduate students' engagement with online course material and activities can be increased if the materials selected for an online course describe specific techniques they can apply in their working lives. There lies a vital question of whether there is any difference in terms of learners' preference of online resources and interactions in the online learning environment of undergraduate and postgraduate learners. If so, this leads to discovering appropriate strategies to be adopted by open distance educators in addressing the needs of these two groups of students.

Synthesizing the related literature, this paper looks at the following research questions:

- 1) What is the pattern of learners' interaction with online content based on the frequency/activity in accessing online content and the types of learning resources preferred in the LMS?
- 2) What is the pattern of learners' interaction with peers and teachers based on the dimensions of interaction, depth of discussions and categories of exchanges in the online forums?
- 3) Is there any difference observed in the pattern of learners' interaction with online content and in the online discussion forums for undergraduate versus postgraduate courses?

Methodology

To ensure comparability, data from the LMS of a sample undergraduate course (herein referred to as UG1) and a sample postgraduate course (herein referred to as PG1) of similar nature were selected from courses offered by the School of Business Administration in the January 2010 semester. Both courses that were selected had significant online resources available and active participation in the online discussion forums. A cross-sectional analysis was done at the end of the semester. This study was undertaken mainly using content analysis and quantitative analysis on indicators defined to measure the students' interaction with online content, i.e. pattern/activity level and frequency of accessing online learning resources, as well as types and feedback capability of online learning resources. Three indicators, namely dimension of interaction, thread level of discussion, and category of exchanges were further employed to measure the students' interaction within the online forum discussions.

In order to track the access of online content by the learners, web-based resources in the LMS were grouped into five categories:

- OR1: Static pages (e.g. Welcome Letter from the Course Coordinator, Course Overview Information and User's Guide)
- OR2: Folders of course content (e.g. Attachment files including reading materials, case studies, past year examination questions, and summaries of the study unit in the form of Word documents, etc.)
- OR3: Hyperlinks to external websites (e.g. educational and related websites related to the course content)
- OR4: Online Discussion Forums (asynchronous)
- OR5: Online Quizzes

Based on Oliver and McLoughlin (1997), who explored the dimensions of interaction by classifying interaction activity into five parts, i.e. social, procedural, expository, explanatory and cognitive; the social dimension can be defined as to include discussions of a social nature which are not directly associated with the course content, while the procedural dimension involves explanation on course-related procedures, requirements and administrative issues. The expository dimension involves demonstration of knowledge/facts without much further elaboration while the explanatory dimension refers to elaborate explanation on knowledge and developed content based on the learner's response. Finally, the cognitive dimension involves providing constructive feedback and detailed commentary on course content via critical thinking which leads to knowledge development.

The content of the web-based interaction by the initiator and respondents, are categorized into four groups of exchanges, i.e. from teacher to group, from teacher to individual learner, from individual learner to teacher and from individual learner to group. In the teacher to group category of exchanges, the teacher initiates a discussion and addresses it to all students in the group. As for the depth of interaction, Thread=1 means there is no reply to the posting initiated, Thread=2 refers to only one ensuing reply, Thread=3 indicates two replies, and Thread \geq 4 indicates that there are at least three replies to a discussion topic started.

Findings and Discussion

Online Learning Resources in WawasanLearn

WawasanLearn has been in-use since the year 2007 in WOU, and English is the medium of communication despite learners' diverse language background. *WawasanLearn* has good editing ability which is GUI-based and has a strong monitoring function via a statistical reporting feature and a log function. Among the common functions available are static course materials (e.g. uploaded files, text pages, web pages, links and directories), as well as interactive and social course materials (e.g. online quizzes, asynchronous forum boards and synchronous chats). The layout of the main page of a sample course in WOU is shown in Appendix A.

The left panel of the course page shows the activities (e.g. various online resources, online forums, online quizzes), the administration related functions, and a link to other courses that the learner is enrolled in. On the right panel, learners are able to view the latest news of the course (which is currently set as announcements from the teacher), upcoming events (e.g. online quizzes open), calendar (which is a two-way tool where study activities are planned for the learners, and the individual learners are able to set in the calendar his/her own study plan), messaging capability (to communicate on a one-to-one basis with teachers and other learners), as well as other applications relevant to the course. The essence of the online resources designed for the course is in the main window of the page. In this section, learners are able to access all the online forums (which serve specific purposes, e.g. announcements from the teacher, public forum, as well as group discussion forums based on tutorial topics of the semester). In addition, learners are able to access the supplementary course materials and other resources in place to facilitate their learning. These are categorized based on the five tutorial/study units for the course. Common resources within each study unit/tutorial include a folder that contains additional summaries/notes in presentation files and documents, hyperlinks to relevant external websites, online quizzes and other online activities. While most of the online resources are put in place at the start of the semester, the teachers were observed to constantly post additional resources and initiating/replying to forum discussions throughout the semester.

Summary of Key Information of the Courses

Figure 1 presents a summary of the key information of the samples selected for analysis in this study.

Figure 1: Summary of Key Information of UG1 and PG1

Information	UG1	PG1
Number of learners enrolled for the course	231	193
Average age	29	35
Gender (Male/Female)	45% Male, 55% Female	58% Male, 42% Female
Participation rate (%) (No. Online / No. Enrolled)*100%	96	99
Average time online (hours)	21.5	24.8
Average frequency of access over a semester (times) (Total No. of Access/ No. of Learners Online)	11.6	17.3

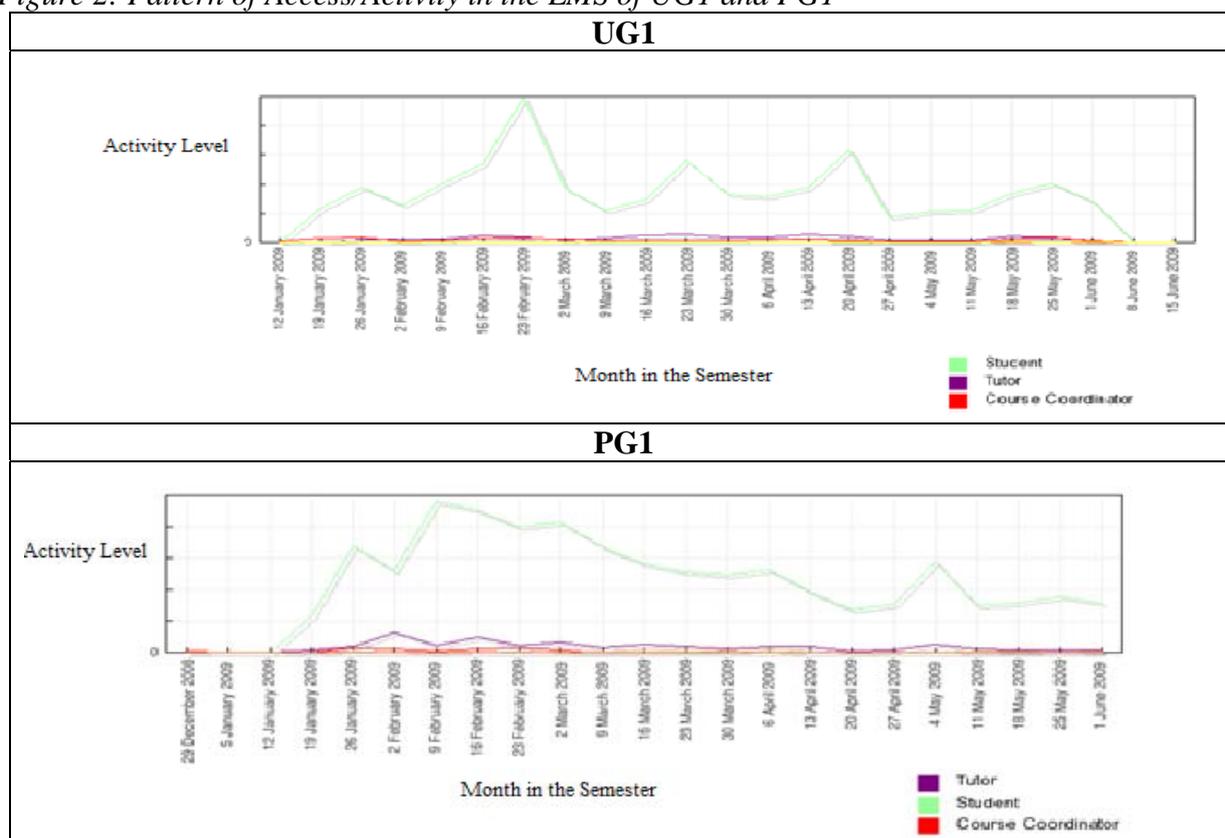
Though the number of learners enrolled for UG1 was higher than the number of learners in PG1, the absolute value of the number of learners enrolled for the course was of lesser significance with regards to the main objectives of this study. The key measurement in this study was based on percentage and not absolute value, and subsequent analysis was done focusing on relative measurement of the pattern of learners' access to the online content during the semester. In

quantifying the participation rate and total time of access, redundant data from the log files of the activities in the LMS have been eliminated to ensure a true reflection of the learners' learning pattern with the online content. Learners in PG1 were higher in average age, with slightly more male learners and a higher participation rate, longer average time online and higher average frequency of access over a semester.

Pattern of Access/Activity across Time in *WawasanLearn*

The pattern of access/activity across time in a semester in the LMS of both courses is shown in Figure 2 below.

Figure 2: Pattern of Access/Activity in the LMS of UG1 and PG1



It is observed that the frequency of learners going online was somewhat evenly distributed throughout the semester for both courses. Peaks in the activities of both courses were observed during the tutorial weeks, the highest being in the second month (tutorial 2 week) of the 18-week semester, and with a declining trend towards the end of the semester. However, the activity level for UG1 was lower than PG1 during the start of the semester. Postgraduate learners seem to be more initiated and independent in accessing the LMS for online resources; while undergraduate learners' access to the LMS improved after they had attended the first tutorial. For UG1, the activity level in the LMS declined immediately after tutorial 2, with a slow pick-up for the subsequent two tutorials. However, the activity level in the LMS for PG1 was sustained at a higher level than in UG1 even though the activity showed a steady drop. This indicates that the motivation for learning for postgraduate students is mainly to obtain knowledge rather than merely being examination-oriented. Access to the LMS of UG1 depicts a similar trend with PG1 a week before the examination. However, the postgraduate learners appeared to be doing earlier preparation for revision as the activity level improved to another peak a week before the last tutorial of the semester.

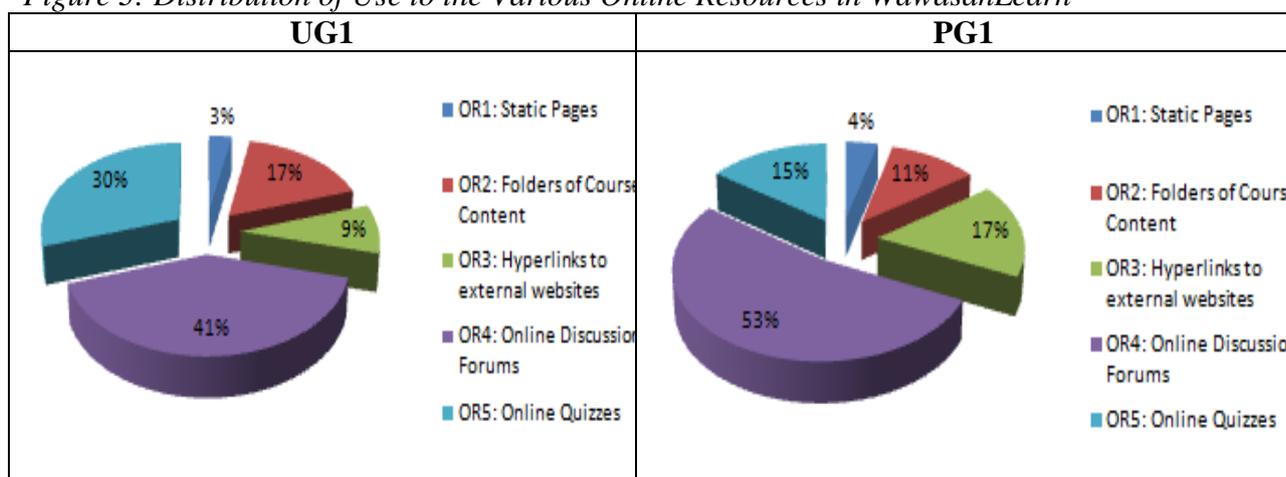
Learners' Interaction with Online Content in *WawasanLearn*

The evaluation and feedback capability of the online resources was investigated in terms of whether it permits one-way non-interactive or two-way interaction between learner-content to evaluate the outcome of learning arising from the interaction. Online content that allowed social presence would be the welcoming message posted by the teacher. Procedural-related content comprises mainly of text files or web-pages that present generic information about the course, such as learning objectives/outcomes and assessment tasks. Interaction with online learning materials that involves demonstration of knowledge and facts without much further elaboration represents interaction in the expository dimension. Online learning resources that are contained in the explanatory dimension may include materials uploaded, for example, presentation slides

and additional notes in Word documents that explain the essential concepts about the course. This may also be sharing of frequently-asked questions from learners in the previous semesters which could be presented in a web page. These resources help learners to clarify any doubt that they have and reinforce their understanding of the basic principles of the course content. The final dimension of interaction with online content at cognitive level involves providing constructive feedback and detailed commentary on course content via critical thinking that leads to knowledge development. Online learning resources that permit interaction at this level include online tests/quizzes. The exchanges in the online discussion forums would cover all these dimensions.

Figure 3 shows an analysis from the log files of the learners' use of online resources in *WawasanLearn*.

Figure 3: Distribution of Use to the Various Online Resources in *WawasanLearn*



It was found that the undergraduate and postgraduate learners preferred to use Online Discussion Forums the most (41% and 53% respectively), but did not access many of the Static Pages (3% and 4% respectively). Learners in UG1 spent more time in accessing the Online Quizzes (30%) than the postgraduate learners (15%), but learners in PG1 (17%) favor the Hyperlinks to External Websites more, compared to the undergraduate learners (9%). It was also observed that both the undergraduate (17%) and postgraduate (11%) learners accessed the Folders of Course Content almost equally, with slightly higher access from the former.

Learners from UG1 were keen to participate in the online quizzes prepared by the teacher, which include numerous types of questions such as multiple choice questions and true/false questions. Each time the learners attempt the online tests; questions will be extracted from the question bank in the LMS and presented to the learners. Upon completion of the test, learners will know their score and obtain answers to the questions attempted. Online quizzes have become a web-based resource that allows real-time assessment of the learners' learning. Though scores obtained are not taken into account as part of the course marks in WOU, online quizzes are perceived as a valuable learning resource to test learners' understanding and they allow learners to be better prepared for the examination. This reflects the undergraduate learners' higher uncertainty avoidance as they aim to perform better in the final examination via practice exercises and constantly testing their knowledge. They have also shown a preference to accessing the resources from folders of course content, which mostly include exercise questions, answers to the exercises in the printed materials and lecture notes. These resources mainly explain and elaborate the essential concepts of the study unit. Hence, in terms of the dimension of interaction with this type of online content, it would more be at the expository or explanatory level.

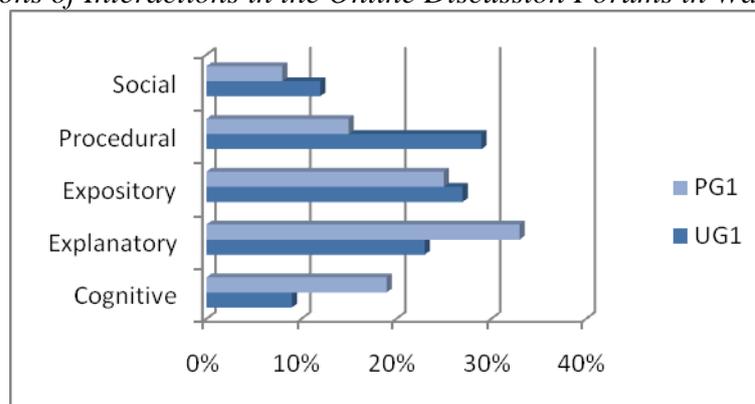
On the other hand, learners from PG1 have shown greater preference to exploring the external web links provided, which are related to the course topics. They have demonstrated the initiative to learn something more than is required as well as to broaden their thinking, and not just confine themselves to the course materials provided. Generally, undergraduate learners still perceived printed/online learning materials as most reliable and authoritative in determining their learning outcome from the course and may face difficulties in grasping the main points arising from browsing and reading from external websites. Learners in PG1 used more than 50% of their time participating in the online discussion forums that allow asynchronous exchanges of ideas among peers and with their teacher. This indicates that they value online resources which allow for two-way communication and also suggests that they are getting acquainted with active involvement in the online environment. It is also noted that postgraduate learners seek to acquire knowledge for self-enhancement and to apply the knowledge gained in their daily work.

Learners' Interaction with Teacher and Peers in the Online Discussion Forums

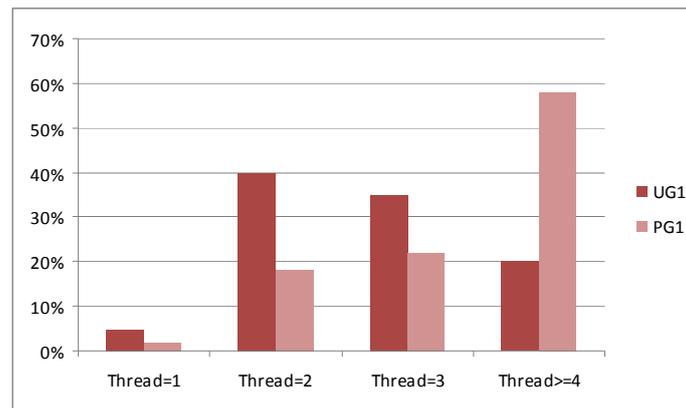
In this study, the content of exchanges preserved in the online discussion forums is viewed as one of the important learning resources present in the online learning environment. Thus, learners' access to the online forum has been one of the indicators of learners' interaction with online content. Discussions in the online forums are often a reflection of learners' thinking process related to the course content. Learners' discussions on the online forums create a learning environment that reflects the online collaboration effort. In the forums, learners are able to view the entire process of the queries raised, the analysis of the queries and how the queries are resolved or concluded among their teacher and peers. Hence, learners are able to extend their knowledge and clear any doubts that they have about a subject, despite not posting any response.

There were a total of 181 discussion topics initiated in the Forums of UG1 and 168 discussion topics in PG1. Figures 4, 5 and 6 depict an analysis of the exchanges transcribed from the Online Discussion Forums of UG1 and PG1.

Figure 4: Dimensions of Interactions in the Online Discussion Forums in WawasanLearn



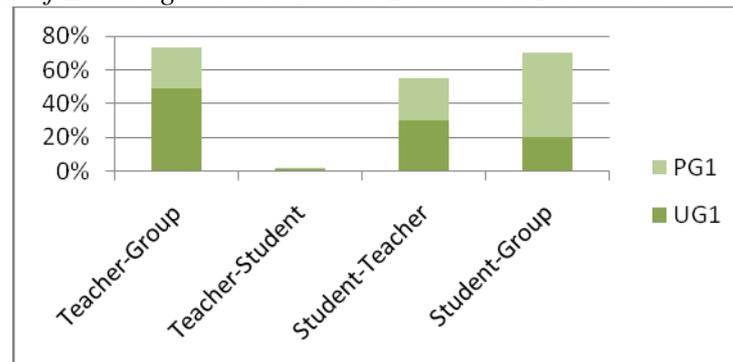
For online discussions in UG1, the Procedural dimension was the most dominant (29%), followed closely by exchanges in the Expository category (27%) and the Explanatory dimension (23%). On the other hand, exchanges in PG1 indicated the Explanatory dimension (33%) as the most dominant dimension, followed by the Expository (25%) and Cognitive (19%) dimensions. While the Cognitive dimension was the least dominant for the undergraduate learners (9%), Social exchanges were the least dominant for the postgraduate course (8%).

Figure 5: Depth of Interactions in the Online Discussion Forums in WawasanLearn

As shown in Figure 5, most discussions in UG1 remained at Thread=2 (40%) and Thread=3 (25%), while Thread=4 accounted for only 20%. However, for PG1, 58% of the discussions proceeded to the fourth thread and beyond. For both courses, there were very few messages (5% for UG1 and 2% for PG1) which remained at the first thread without any ensuing reply.

With many formal education setups still being heavily examination-orientated, learners' questions and concerns tend to gravitate towards examination procedures and strategies, as shown in the dominant Procedural dimension for UG1. Web-based interactions not only fulfilled the learning requirement, but also addressed the social need for bonding and friendship. This finding also highlights the elements of collectivism in Malaysian culture, particularly in the case of UG1, in which exchanges in the Social dimension accounted for 12% of the total.

The findings have also indicated that postgraduate learners aim to gain more knowledge in their learning activities as reflected in the exchanges in the explanatory dimension. At the same time, the results implied that they are quite independent and could easily adapt to a web-based mode of education. As observed in PG1, learning was the acquisition of knowledge or skills from others and a change in understanding of external things and oneself. Learners in PG1 portrayed independent thinking in articulating their views on the discussion topics and appreciated the support and sharing of knowledge by teachers and peers in the web-based learning environment. Furthermore, they were intrinsically motivated in enrolling for the course to improve their economic growth and self-respect based on ability and competence. It appeared that PG1 learners appreciated the online platform for subject matter related discussions at a slightly higher level of dimension of interaction. These included demonstration of knowledge/facts with elaborated explanation based on peers' and teacher's responses, as well as providing constructive feedback and detailed commentary on course content via critical thinking. Statistics for UG1 indicated a high level of Thread=2 interaction activity due to the fact that most exchanges were in the Procedural dimension and were geared towards obtaining a single direct answer to a query.

Figure 6: Categories of Exchanges in the Online Discussion Forums in WawasanLearn

As shown in Figure 6, most messages were initiated by the teacher to the group of students (49%) in UG1. Messages from student to teacher accounted for 30%, and student to group for another 20% for discussions at undergraduate level. Meanwhile, learners in PG1 posted most discussions to their group/peers (50%), while 25% of the discussions were initiated by the student to teacher and 24% of the discussions were initiated by teacher to group. Similar observations were made in both UG1 and PG1, where the least exchanges happened in the category of teacher to student messages as they usually used the Messaging system in the LMS for one-to-one communication.

For undergraduate courses, the teacher often planned the learning tasks and followed up with directives or instructions, which were particularly visible at the beginning of the course. Teaching-learning activities for UG1 appeared to be more teacher-centered as compared to PG1. Learners in PG1 appeared to value sharing and exchanges of knowledge with their peers, and the teacher was viewed as a facilitator. Discussions in PG1 were very much learner-centered with the learners engaging in thoughtful deliberation with their course mates.

The above findings have also shown that both undergraduate and postgraduate learners, in general, are adapting well to the online learning environment. In fact, the postgraduate learners have shown great participation in, and utilization of, the online resources in the LMS.

Recommendations and Conclusion

Various elements, such as the types of web-based resources, functions and usage of the resources, interactivity and feedback capability of the resources and so on, often influence the learners' interaction with online content. It is indeed important to consider these elements and the interplay among them in improving learners' frequency of access to the online resources and their level of participation. While the selection and delivery of online content should take into consideration practical guidelines of good web-based content such as accessibility, flexibility, interactivity, ease of navigation, motivational value and its effectiveness, the online environment should be sustained in catering to the needs of the students.

As general guidelines, the online learning environment should always allow for quality interaction between the learners and content, learners and teacher, as well as learners and peers. The design and organization of online learning materials should be closely related to the intended learning outcomes, and not merely having loads of materials to supplement the existing materials. Online learning materials need to be congruent with the learning objectives of the course. Providing as many resources as possible to the learners tends to be thought of as effective teaching, however, this could actually divert the learners' attention away from focusing on the intended learning outcomes to be achieved and possibly cause information overload. The interaction with content should not just be a one-way interaction via a purely text display or conversion of learning materials to digital forms. The organization of online learning materials may include other forms which have the capability of providing immediate feedback and stimulating the learning process. The knowledge exchanges generated from interaction among the learners and between learners and teacher have become the essential learning materials for open distance learners. As ODL learners tend to feel lonely throughout their journey of acquiring knowledge, timely feedback plays a vital role in eliminating the negative feelings associated with on-line learning. Feedback can be broadly defined as the exchange of information between learner-instructor, learner-learner and learner-LMS with regard to an action, event, or process that results in enhanced student learning. Appropriate training is crucial to equip teachers with the necessary facilitation skills towards enhancing learner-centered interaction in the web-based learning environment, acknowledging the fact that teachers are managers of the learners' learning experience.

This study has uncovered differences in the online learning behavior of undergraduate and postgraduate learners. Based on the findings above, several recommendations are proposed to enhance the design and delivery of web-based content, aimed at maximizing the efficacy of the online learning environment of undergraduate and postgraduate courses in open distance education.

Teachers can actually plan the phased availability of online content based on the habits of learners' access to the online resources during the semester. This also serves as a means to promote and sustain the motivation of the learners in utilizing the online learning environment. Based on the analysis of the pattern of access/activity in the LMS, the activity level for undergraduate courses can be further enhanced in the beginning of the semester by the teacher contacting the students before the commencement of the first class and welcoming them to the course. In order to sustain the interest of the undergraduate learners throughout the semester, the teacher can upload further online activities after each tutorial. On the other hand, as postgraduate learners are more independent and motivated to acquire/share knowledge, constant updates about the course content that are relevant to the industries (e.g. case studies) can be posted in the LMS for discussion.

In addressing the findings on the learners' interaction with online resources, more online quizzes can be made available to the undergraduate learners for them to test their understanding of the course content. Teachers should incorporate a bigger variety of question types via the establishment of a question bank to capitalize on the effectiveness of online tests. From the scores recorded and analysis of questions attempted by the learners, teachers would then be able to improve on the course content delivery. As for the postgraduate courses, discussions in the online forums should be further encouraged, while higher level questions can be posted as online quizzes for the courses. While hyperlinked websites serve as additional learning materials that supplement course content, the number of hyperlinks made available for the undergraduate learners should not be too many as they may divert the learners' attention. In this case, it is more effective if teachers could summarize the main points from supplementary readings for their learners.

As for improving the interaction in the online discussion forums for undergraduate courses, the teacher can initiate more discussions to guide exchanges at a higher dimension level, weaning learners away from procedural matters. This will then lead to them engaging in deeper interactions in the forums. At the same time, online teaching-learning for undergraduate courses should move towards student-centered learning. Teachers for these courses can first create a 'safe' and welcoming environment in encouraging the learners to initiate discussions in the virtual space. Teachers need to capitalize on various techniques to break the ice as well as to create a friendly web-based learning environment in order to eliminate the gap caused by distance and non-face-to-face communication particularly for undergraduate learners. Once the learners are used to the web-based communication environment, they will adopt and participate in online communication.

In conclusion, the quality of interaction between learner and online content, as well as learner-teacher-peers has to be ensured in achieving efficacy of web-based teaching-learning towards the creation and maintenance of sustainable learning communities.

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Appendix A: A Snapshot of the Main Page of a Sample Course in *WawasanLearn*

Administration

- Turn editing on
- Settings
- Groups
- Reports
- Questions
- Scales
- Files
- Grades

My courses

- [BBM102/05 Microeconomics](#)
- [BBM103/05 Principles & Practice of Management](#)
- [BBM104/05 Principles of Marketing](#)
- [BBM202/05 Macroeconomics](#)
- [BBM203/05 Business Statistics](#)
- [BBM205/05 Business Accounting I](#)
- [BBM206/05 Business Accounting II](#)
- [BBM208/05 Business Ethics](#)
- [BAC302/05 Advanced Cost & Management Accounting](#)
- [BAC303/05 Accounting Information Systems](#)
- [BAC304/05 Company Law](#)
- [BAC306/05 Advanced Financial Accounting & Reporting](#)
- [BBF302/05 Financial Management and Analysis](#)
- [BBF305/05 Investment Management](#)
- [BBF308/05 International Financial Management](#)
- [BIS301/05 Data Warehousing & Knowledge Management](#)
- [BLC302/05 Logistics Management](#)
- [BLC303/05 Supply Chain Management](#)
- [BLC307/05 Inventory Management](#)
- [BMG301/05 Services Management](#)
- [BMG304/05 Strategic Human Resource Management](#)
- [BMG305/10 International Business](#)
- [BMK301/05 Consumer Behaviour](#)
- [BMK303/05 Sales & Distribution Management](#)

Topic outline

BBM 205/05 Business Accounting I

Welcome! Have a great semester!

July 2010 TMA Submission Deadlines
 Student Guide for Online Assignment Submission
 Link to Online Assignment Submission System

ANNOUNCEMENTS

- Welcoming Letter from Course Coordinator
- Announcements from Course Coordinator
- Announcements from Tutor

ONLINE FORUMS

- Public Forum
- Group Discussions
- Tutorial 1
- Tutorial 2
- Tutorial 3
- Tutorial 4
- Tutorial 5

1 SUPPLEMENTARY COURSE MATERIALS AND RESOURCES

For your reading pleasure - articles from Accountant Today

Course Overview

- A Brief Introduction about the Course
- Suggested Learning Schedule
- Learning Assessments
- Terminology

Unit 1

- Supplementary Materials for Unit 1

Online Activities

- Accounting Basics
- The Accounting Equation
- Chapter 1 Quiz 1
- Chapter 1 Quiz 2

Tutorial 2

- Supplementary Materials for Unit 2

Online Activities

- About Accounting
- The Accounting Cycle
- Glossary of Accounting Terms by MASB
- Chapter 2 Quiz 1
- Chapter 2 Quiz 2
- Chapter 3 Quiz 1
- Chapter 3 Quiz 2
- Chapter 4 Quiz 1
- Chapter 4 Quiz 2

Tutorial 3

- Supplementary Materials for Unit 3

Online Activities

- More about Inventory
- Chapter 5 Quiz 1
- Chapter 5 Quiz 2
- Chapter 6 Quiz 1
- Chapter 6 Quiz 2

Latest News

Add a new topic...

20 Jul, 07:57
TEOH AI PING
TMA 1 Question 2 (Pg 35 of textbook) more...

12 Jul, 23:30
TEOH AI PING
Welcome to BBM205/05 Business Accounting II more...
Older topics ...

Upcoming Events

There are no upcoming events

Go to calendar...
New Event...

Calendar

August 2010

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Global events
 Course events
 Group events
 User events

Loan calculator

Amount of loan

Repayment amount

Loan term (years)

Interest rate

Monthly

Online Users

(last 5 minutes)
 TEOH AI PING

Messages

No messages waiting
 Messages...

Section Links

1 2 3

...continue to next page

- Research
-  BMK306/10 Strategic & International Marketing
-  BMG511/03 Managing Human Resources
-  BBM501/03 Economic Environment of Business
-  BAC501/03 Accounting and Finance
-  BBM521/03 Research Methods
-  BIS551/03 Electronic Commerce
-  BMK501/03 Marketing Management
-  BMG531/03 Quality Management
-  BMG541/03 Disaster Management
-  BMG551/03 Project Management
-  BPA502/03 Public Policy
-  BPA503/03 Development Planning

[Tutorial 4](#)

 Supplementary Materials for Unit 4

[Online Activities](#)

-  Accounting Information System
-  Accounting Software
-  Internal Control
-  Bank Reconciliation
-  Chapter 7 Quiz 1
-  Chapter 7 Quiz 2
-  Chapter 8 Quiz 1
-  Chapter 8 Quiz 2

[Tutorial 5](#)

 Supplementary Materials for Unit 5

[Online Activities](#)

-  Receivables
-  Payables
-  Bad Debt
-  Investment
-  Chapter 9 Quiz 1
-  Chapter 9 Quiz 2
-  Chapter 11 Quiz 1

2 ASSIGNMENT FILE, SELF-TEST AND ONLINE QUIZZES

-  Tutor Marked Assignments (TMAs)
-  Finished your Revision? Test your understanding here!

3 GUIDE FOR TUTORS

-  Statistics on students WawasanLearn usage- July 2010
-  CCTutor Forum
-  Tutor Handbook 2010
-  Permission to use hyperlinks
-  Supplementary Materials for Tutors (Slides etc.)
-  Latest Tutor Guide for Online Assignment Submission