Assuring the Quality of Online Teaching and Learning: The Case of Wawasan Open University

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Abstract

The dynamic business environment and powerful market forces in the 21st century are challenging leaders at open universities to compete successfully in the national and global higher education stage. The notion of quality is becoming an important and overriding issue with the paradigm shift in the education landscape due to the rapid penetration of internet usage. Open universities are experiencing pressure from numerous stakeholders to become more client-focused, particularly in its provision of technology-enhanced education to systematically support the learning experience of open distance learners. In the pursuit of establishing institution and national/regional-based quality assurance practices, Asian open universities should pay particular attention to one of the key components within the overall QA framework, i.e. the web-based teaching and learning on the online learning management system (LMS). The assurance of quality in the web-based teaching and learning component is vital to support the effective and efficient delivery of open distance education within the blended approach adopted by many open universities.

In this study, the authors first examined the dimensions of quality assurance of key services that are closely associated to web-based education in the online LMS of Wawasan Open University (WOU). The authors then conducted an analysis on the pattern of interactions in the online LMS to examine the actual activities of the learners in the web-based environment. Synthesizing the findings, indicators that address diverse facets and components of quality relevant to web-based teaching and learning in the online LMS were identified. The authors then discussed the application of the quality components within the overall QA framework in WOU to further enhance the quality of its web-based teaching and learning component. Assessment on learners’ satisfaction in WOU was done to determine the effectiveness of the QA components in the online LMS. The QA components identified in the web-based teaching learning within online LMS are then recommended to Asian open universities on the integration of these components in their overall QA framework.

Keywords: quality assurance, e-learning, web-based teaching and learning, online learning management systems
1.0 Introduction

The dynamic business environment and powerful market forces in the 21st century are challenging leaders at open universities to compete successfully in the national and global higher education stage. Some educators (such as Nissenbaum and Walker, 1998; Trinkle, 1999) have concern that open distance education may compromise the quality of education as delivered by the conventional institutions. The notion of quality is becoming an important and overriding issue with the paradigm shift in the education landscape (Unesco, 2009) and due to the rapid penetration of Internet usage in education (Rovai and Downey, 2010).

Open universities are experiencing pressure from numerous stakeholders to become more client-focused, particularly in its provision of technology-enhanced education to systematically support the learning experience of open distance learners. As open universities in Asia and around the world are actively developing and maintaining their respective institution and national/regional-based quality assurance (QA) framework and practices, particular attention should be given to one of the key components within the overall QA framework, i.e. the web-based teaching and learning on the online learning management system (LMS). The assurance of quality in the web-based teaching and learning component is vital to support the effective and efficient delivery of open distance education within the blended approach adopted by many open universities.

There have been extensive studies done on the overall management of quality assurance of higher education (such as Hoecht, 2006; Houston, 2008; Pillay and Kimber, 2009; Shah, Wilson and Nair, 2010; Kettunen, 2010; Latchem, 2011) and also in the context of open distance education and/or e-learning (such as Jung, 2005; Belawati and Zuhairi, 2007; Jung and Latchem, 2007; Jung 2009). However, specific studies on the development of quality assurance components that addresses learners’ expectations and activities with regards to online LMS in the context of Asian open universities are limited.

Delivering high level of service quality to clients is important to service organizations, including the higher education institutions (Brochado, 2009). Service quality has been identified a robust predictor of student satisfaction (Stevenson and Sander, 1998; Helgesen and Nesset, 2007). Consistent with findings from previous research, recent literature (such as Lee, 2010; Udo, Bagchi and Kirs, 2011) indicated that service quality is a key factor of customer satisfaction in the educational and e-learning setting. Flexibility, responsiveness, interaction, student learning, technical support, and technology of online learning influence the satisfaction levels of students enrolled in Internet-based online classes (McGorry, 2003). Rovai (2003) suggested that the quality of technology, support services, as well as course design and instruction must be evaluated in order to monitor student satisfaction and performance in online education. In evaluating service quality of e-learning, Zhang, Zhu, Hu and Li (2004) specified that organizations must ensure adequate understanding of the needs and expectations of customers and should gather customer feedback and satisfaction with the services provided.
Hence, students’ feedback within universities has increasingly become a vital concern in delivering quality education within the vigorous setting of demand and supply of higher education institutions (Marcua, Zaharie and Osoian, 2009), which is also applicable to open universities. Student evaluation of teaching is a fundamental system for assuring teaching quality at higher education institutions (Bie and Meng, 2009). The identification of appropriate QA components for web-based delivery of education via the online LMS demands consideration on various facets of input to the QA system, particularly from the clients or the open distance learners in the context of open universities. Using students’ expectations in developing quality assurance model (Stevenson, Muda, Karlsson, Szeky, Sander and Read, 2000) is one of the key aspects to ensure an effective system in ensuring quality during the teaching learning process.

2.0 Research Framework and Research Methodology

In this study, the authors presented a case analysis on the identification, development and assessment of QA indicators and practices of web-based teaching learning via online LMS in Wawasan Open University (WOU). This study focused on the expectations and actual activities in the online LMS, towards satisfaction of the key stakeholder, i.e. the clients / open distance learners. This framework is in-line with the ISO 9001 international standards on the requirements for quality management system which promotes a process approach in conjunction with the Plan-Do-Control-Act quality improvement cycle first promoted by Deming. In addition, related benchmark indicators of the Malaysian Qualifications Agency with regards to aspects of delivery of quality education are also addressed.

The main objectives of this study are:

1. To examine the dimensions of quality of key services from open distance learners’ perspective that are closely associated with online LMS.
2. To investigate the actual pattern of learners’ activities and interactions in the online LMS.
3. To identify the QA components of web-based teaching learning in the online LMS based on the findings.
4. To discuss the application of the QA components in the online LMS of WOU and the assessment of learners’ satisfaction on web-based teaching learning platform.
5. To provide recommendations for open universities on the integration of QA components within web-based teaching and learning in their overall QA framework.

Figure 1 shows the conceptual framework of this case study.
The authors carried out survey and interviews with students to obtain the primary data, as well as content analysis on the activities of the online LMS to analyse the secondary data. Specifically, the authors first examined the dimensions of quality of key services that are closely associated with LMS by administering a questionnaire to a sample of 408 active undergraduate learners from the inaugural January 2007 semester intake students undertaking Business programmes. The questionnaire was formulated based on the dimensions of service quality, SERVQUAL measures, namely reliability, assurance, responsiveness, empathy and tangible (Parasuraman, Zeithaml and Berry, 1988). In order to determine the service quality expected for web-based teaching and learning in the online LMS, the SERVQUAL instrument was customized by consolidating the ‘expectation’ section into 10-items/statements with a 9-points Likert scale across the five dimensions of service quality. Learners were asked to rate whether the service quality provided was higher (7 - 9), met with (4 – 6), or lower than (1 - 3) their expectations on each dimension. To assess the relative importance to learners on the different service quality dimensions, five (5) statements were formulated, in which respondents were required to weigh the dimensions by allocating a total of 100 points among the five dimensions of service quality.

The authors also conducted an analysis on the pattern of interactions in the online LMS of the identified sample courses offered in the School of Business and Administration via a cross-sectional study at the end of subsequent semester. Content analysis and quantitative analysis were conducted on indicators to measure the students’ interaction with online content in terms of the pattern/activity level and frequency of assessing online learning resources, as well as the types of online learning resources preferred. Learners’ interaction with the web-based resources and interaction in online forum discussions were investigated based on Moore (1989) and the dimensions of exchanges by Oliver and McLoughlin (1997) and Oliver, Omari and Herrington (1997). Learner interaction in the online learning environment can be categorized in the dimensions of social, procedural, expository, and cognitive. Hillman et al. (1994) argued that intervening technologies enable learners to communicate with the content as well as interact with teacher and other learners, while technologies that deliver instructions to distance learners are often classified as two-way interactive or one-way non-interactive (Bates, 1995).
Web-based resources in the online LMS of WOU were grouped into five categories to identify the preference of materials by learners:

WB1 : Static pages  
(e.g. Welcome Letter, Course Overview Information and Guide)

WB2: Folders of course content  
(e.g. Attachment files including presentation files, reading materials, past year examination questions, etc.)

WB3: Hyperlinks to external websites  
(e.g. educational and related websites that were related to the course content)

WB4: Online Discussion Forums (asynchronous)

WB5: Online Quizzes

Synthesizing the findings, indicators that address diverse facets and components of quality relevant to web-based teaching and learning in the online LMS were identified. The authors then discussed the application of the quality components within the overall QA framework in WOU to further enhance the quality of its web-based teaching and learning component. Assessment on learners’ satisfaction in WOU was done to determine the effectiveness of the QA components in the online LMS.

3.0 Background of Wawasan Open University (WOU)

The vision of Wawasan Open University (WOU) is to be a vibrant community that inspires life-long learning, supports innovation and nurtures all-round personal growth. This vision is clearly reflected in its mission statement which declares that the University is committed to the expansion of opportunities in higher education and to teaching excellence aimed at increasing the level of knowledge and scholarship among all Malaysians. Owned by the Wawasan Education Foundation, WOU offers accessible, flexible and affordable education to the adult community in support of lifelong learning. At WOU, quality underpins and undergirds everything it does. WOU benchmark its academic programmes, courses, course materials and the entire learning process to produce well-rounded, knowledgeable, competent professionals against international best practices.

A distinctive characteristic of the ODL system is its learner-centric form as against a teacher-centric form of education used in a conventional university. Over 8,000 people in Malaysia, ranging in age between 21 and 71 years, have experienced the learning opportunities at WOU with majority of them falling within the 21 – 30 age group.

WOU opened its doors to students in January 2007 with 11 undergraduate programmes and the first postgraduate programme was subsequently offered in January 2008 semester. The semester system in WOU consists of 2 semesters, i.e. January to June, and July to December. Currently there are 38 programmes from the four Schools of the University – the School of Business and Administration, School of Science and Technology, School of Foundation and Liberal Studies, and the School of Education, Languages and Communications.
Since its establishment in 2006, the University has expanded in keeping with its goal of reaching working adults across the nation. There are now six regional offices— in Penang, Ipoh, Kuala Lumpur, Johor Bahru, Kota Bharu, and Kuching and one regional support office in Petaling Jaya— to offer learning support and services to the students.

4.0 WOU Education Delivery Model

4.1 Course Materials
WOU comprehensive self-contained course material (some of which including texts books) that is provided either in print or CD form enables its students to engage in learning activities at any time and from anywhere to suit individual learning styles and needs. These materials are pedagogically developed using a course development team (CDT) approach and designed for self-learning. The CDT comprises team of academic experts (local or international staff) working together with instructional designers and language editors. The involvement of an External Course Assessor forms part of the Quality Assurance of the WOU course development process.

4.2 Learning Support Services
To assist students in their studies, WOU provides the following quality learning support services:

- Tutorials conducted by tutors who are part-time academics with relevant subject expertise and experience. Tutors are also available for consultation/counselling via the telephone at appointed times twice a week.

- WawasanLearn is a Moodle based Learning Management System (LMS) is an online learning support is provided on a 24x7 basis that enables students to access additional supplementary materials, links to relevant websites, forum discussions with members of their own tutorial groups or course mates all over the country as well as exchanges with their tutors and course coordinators.

- The University's extensive electronic library resources that can be accessed anytime and from anywhere with Internet connections.

- Advisories through the WOU Regional Offices, Registry, as well as Call Center on administrative matters.

- All the WOU Regional Offices are equipped with Computer Labs, libraries and free access computer terminals for self-study.

4.3 Assessment
The mastery of learning outcomes of WOU courses are evaluated via an assessment strategy that consists of two components ie. continuous course assessment (eg. Tutor Marked Assignment) and a final examination. To pass a WOU course, students are required to pass both components. An External Examiner system is in place as part of WOU QA process to ensure that the examination papers and the exit standards are in compliance with national and international norms.
4.4 Open Entry System
WOU is one of six universities in Malaysia approved by Ministry of Higher Education (MOHE) to admit students through the Open Entry System (OES). The OES enables mature students (≥21 for undergraduates and ≥35 for postgraduates) with minimal academic qualifications to be admitted provided they meet other conditions stipulated by the MOHE. This makes WOU programmes more accessible compared to conventional universities.

4.5 Multiple Exit Points and its Flexible Progression Pathway
In support of the Government’s effort to promote lifelong learning culture in the country, WOU has introduced a series of awards at various levels as outlined in the Malaysian Qualifications Framework. This provides multiple exit points along a ladder of academic attainment to enable Malaysian citizens to move progressively up their level of personal and professional achievement. Students can determine their course load for each semester and the choice of their study programmes.

5.0 Quality Assurance System in Wawasan Open University
WOU is committed towards providing academically rich learning experience to students as well as to meet the needs of the industry and market demand. WOU firmly believes that this must be underpinned by a sound quality assurance system that covers all aspects of the University’s operations. Maintenance of high quality academic standards in WOU is benchmarked against international best practices.

5.1 Quality Assurance Management
Quality Assurance at WOU is directed from the highest policy bodies such as Council and Senate and managed through the Deputy Vice Chancellor (Academic) who chairs the Quality Assurance Committee (QAC) responsible for developing and implementing the University’s QA systems and processes. A Quality Assurance Unit (QAU) headed by a Manager coordinates and oversees the implementation of QA processes across the university, monitoring compliance and recommending continuous improvement measures. The QAU also manages and maintains the quality management system documentation i.e. Quality Policy, Quality Manual, Document Procedures and Quality Records. At the School/departmental level, a Quality Task Force oversees the implementation and review of QA systems and processes. The Quality Task Force works with the QAU and reports to the QAC to keep the University abreast on all QA related matters and continuous improvement plans are regularly incorporated. All committees operate under clearly defined standing orders with minutes recorded and archived.
5.2 Quality Assurance Policy

WOU’s Quality Assurance Policy that governs the University quality assurance system has the following objectives:

a) to establish the necessary quality assurance framework, procedures and performance indicators to achieve the vision and mission of the University;

b) to inculcate a culture of quality and ensure all members of the University community take responsibility for the quality and standard of their work performance;

c) to rigorously and continuously monitor to ensure that the policies are implemented effectively;

d) to develop and incorporate an effective feedback mechanism that enable the QAC to make informed decision of any need to modify or improve the quality standards of the educational programmes in a timely manner.

5.3 Quality Assurance Procedures

WOU has developed an overarching policy document, entitled the Standard Operating Procedures (SOP) Framework that requires all Schools/departments to document their respective processes and procedures based on a standard prescribed University format. This ensures essential information is consistently provided and disseminated to all relevant stakeholders.

The Quality Assurance Unit maintains the record of all the University SOPs, which is easily accessible and regularly updated. In building a shared responsibility of quality assurance culture and achieving greater level of transparency across various levels in WOU, the electronic format of all SOPs are published at the staff portal (intranet) for reference. All the procedures and systems introduced to manage quality can only be improved through the active involvement of all the relevant stakeholders in the University.

6.0 Findings and Discussion

6.1 Dimensions of quality assurance of key services associated with online LMS

As indicated in Table 1, a total of 122 replies were obtained out of the 408 questionnaires that were disseminated. The feedback gathered accounted for almost 30% response rate. Out of the 122 total respondents, almost 60% were male respondents. Most of these respondents are in the 21 – 30 age group while nearly one-third were in between 31- 40 years old. Majority of the respondents (52%) have diploma qualifications who had undergone at least 11 years of formal education in schools and two years of studies at the college level. All the respondents were working adults with most of them (63%) holding a non-managerial level posts.
Table 1: Demographics of the respondents (n = 122)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>51</td>
</tr>
<tr>
<td>31-40</td>
<td>33</td>
</tr>
<tr>
<td>41-50</td>
<td>15</td>
</tr>
<tr>
<td>51-70</td>
<td>1</td>
</tr>
<tr>
<td><strong>Academic qualifications</strong></td>
<td></td>
</tr>
<tr>
<td>PMR/SPM or equivalence of 0-Level</td>
<td>47</td>
</tr>
<tr>
<td>Diploma or equivalence to GCE A-Level</td>
<td>52</td>
</tr>
<tr>
<td>Degree</td>
<td>1</td>
</tr>
<tr>
<td><strong>Employment level</strong></td>
<td></td>
</tr>
<tr>
<td>Managerial and above</td>
<td>37</td>
</tr>
<tr>
<td>Non-managerial</td>
<td>63</td>
</tr>
</tbody>
</table>

Key Findings: Level of Satisfaction by Service Dimensions

The level of satisfaction for all the five service dimensions, as indicated by the mean scores of 122 replies, ranged from 6.4 – 7.5 points out of the 9-points scale shown in Table2. This result indicates that the service quality in WOU online teaching and learning over the LMS has met and slightly exceeded the desired service level of the respondents in their inaugural semester. As depicted in Figure 2, the level of satisfaction for reliability service dimension was the highest, followed by empathy, responsiveness and assurance, and tangibles dimensions.

Table 2: Level of Satisfaction of Service Quality: Mean Scores

<table>
<thead>
<tr>
<th>Statement No.</th>
<th>Statement</th>
<th>Dimension</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Learning Management System, WawasanLearn, is accessible at all times.</td>
<td>Reliability</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7.5</td>
</tr>
<tr>
<td>2</td>
<td>The web-based resources for courses are available in WawasanLearn by the</td>
<td></td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>start of the semester.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>WawasanLearn is helpful and informative to support your learning.</td>
<td>Assurance</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6.9</td>
</tr>
<tr>
<td>4</td>
<td>The content of the web-based resources are appropriate and relevant to the</td>
<td></td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>course syllabus.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The tutors and course coordinators are prompt in replying to your question</td>
<td></td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>posted in WawasanLearn.</td>
<td>Responsiveness</td>
<td>6.9</td>
</tr>
<tr>
<td>6</td>
<td>When you interact with the RO staff on administrative matters related to</td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>WawasanLearn, the staff is ready to assist.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When you interact with the RO staff regarding a specific administrative problem in <em>WawasanLearn</em>, the staff is courteous and willing to help.</td>
<td>Empathy</td>
<td>6.3</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8</td>
<td>When you interact with the tutors and course coordinators regarding a specific academic issue in <em>WawasanLearn</em>, they are willing to guide and share.</td>
<td></td>
<td>8.0</td>
</tr>
<tr>
<td>9</td>
<td>The user interface of <em>WawasanLearn</em> is attractive and easy to navigate.</td>
<td>Tangible</td>
<td>6.2</td>
</tr>
<tr>
<td>10</td>
<td>The quality of the files and other web-based resources posted on the <em>WawasanLearn</em> is clear and accessible.</td>
<td></td>
<td>6.5</td>
</tr>
</tbody>
</table>

**Figure 2: Mean Service Quality Scores by Service Dimensions in the Online LMS**

Nonetheless, although the mean scores of the level of satisfaction for all the five dimensions seems encouraging, there were some areas of services in the online environment that indicated areas of improvement. Attention is needed with regards to improving the dimensions on tangibles, as well as some sections of the other dimensions as well. Specifically, the user interface of *WawasanLearn* and the clarity/accessibility of the files require further improvement. As the target learners are working adults where time is a limiting factor they will expect an interface which is easy to navigate for speedy retrieval of information. The academic staff (Course Coordinators and Tutors) as well as the Regional Office staff need to be well-trained to provide better support on administrative and academic issues raised in *WawasanLearn*. Current level of competency has to be enhanced by providing training particularly to academic staff on areas such as development and management of course content, content enrichment and learner support in and ODL environment. Besides, the materials and information posted in online LMS should be directly relevant to the course content so that learners find it useful and informative. A
proper monitoring system must be put in place to regularly monitor the quality, relevancy and currency of the materials posted.

**Key Findings: Relative Importance of Overall Service Quality Dimensions**

In terms of the relative importance of the service dimensions, the utmost important area, as highlighted by the respondents, was the assurance dimension as depicted in Figure 3. The other service dimensions in the relative importance sequence were reliability, tangibles, responsiveness, and empathy.

![Figure 3: Relative Importance of Service Quality Dimensions in the Online LMS from the Learners’ Perspective](image)

**Key Findings: Level of Satisfaction versus Relative Importance of the Five Service Quality Dimensions**

The survey result highlighted that assurance dimension is perceived as the most important service quality area by the students, but the level of satisfaction (as indicated by the mean score) for the dimension was in 3rd rank (out of 5), as shown in Table 3. The assurance dimension speaks about the competency, expertise, and courtesy of service staff as well as their ability to deliver trust and confidence to the students. This dimension relates to the knowledge, skills and courtesy of the university’s academic and administrative staff which will instill confidence among the students and the quality assurance of online teaching and learning. When the learners have acquired a fulfilling learning experience, they will subsequently share this learning opportunities with the peers, colleagues or family members and they will be the most reliable marketing tools to promote the institution.

**Table 3: Level of Satisfaction versus Relative Importance of Five Service Quality Dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Ranking as per Level of Satisfaction</th>
<th>Ranking as per Relative Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assurance</td>
<td>3 (mean score = 6.9 / 9.0)</td>
<td>1 (average points allocated = 37)</td>
</tr>
<tr>
<td>Reliability</td>
<td>1 (mean score = 7.5 / 9.0)</td>
<td>2 (average points allocated = 18)</td>
</tr>
<tr>
<td>Tangibles</td>
<td>5 (mean score = 6.4 / 9.0)</td>
<td>3 (average points allocated = 16)</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>3 (mean score = 6.9 / 9.0)</td>
<td>4 (average points allocated = 15)</td>
</tr>
<tr>
<td>Empathy</td>
<td>2 (mean score = 7.2 / 9.0)</td>
<td>5 (average points allocated = 14)</td>
</tr>
</tbody>
</table>
One of the key concerns in delivering quality web-based teaching and learning over the online LMS involve understanding and managing learners’ expectation effectively. As reflected in the above results, all identified dimensions of service quality should be addressed in formulating QA components for the online LMS. Particular attention must be given to deal with the dimensions of assurance, responsiveness and tangibles in the case of WOU.

6.2 Pattern of activities and interactions in the online LMS
Following through the progress of the inaugural batch of learners as sampled in this case study, an analysis on their actual patterns of activities and interactions in WawasanLearn was conducted at the last semester of their undergraduate studies. From the log files obtained, activity level of the learners was the highest in Month 2, followed by Month 5 in a 6-month semester in WOU. Similar patterns were observed for the other courses sampled. The average participation rate ([No. online/ No. enrolled] * 100%) for the courses was around 89% and the average time spent online per student during the semester was 23.2 hours.

A further investigation was conducted to the most active course (highest in Activity Level divided by the No. of Students) with 132 students. An analysis was done to uncover the preference of the learners based on their access to the various online resources posted in the course. As shown in Figure 4, learners accessed Online Forums the most and seems to favour Online Quizzes (which did not contribute to the course assessment) as well. Access to download course materials from the folder was average due to the nature of the resource which is one-way and non-interactive. Access was lowest for static pages, followed by hyperlink to external websites.

![Figure 4: Distribution of Learners’ Access to Online Resources](image-url)
In further examining the online discussion forums, it was noted that the course has an average of 5 discussions per Tutorial Group Forum which were mostly initiated by the tutor. However, learners prefer to interact in the Public Forum (with a total of 138 discussion topics initiated) as they exchanged ideas and engaged in online discussions with their peers from all regional offices. The exchanges in the forums were also transcribed based on the dimensions of social, procedural, expository and cognitive to better understand the activities and dimensions of interaction. The results are presented in Figure 5.

Expository dimension was the most dominant (32%), followed closely by exchanges at the Explanatory dimension (27%) and Procedural dimension (23%). Cognitive dimension was the least dominant for the learners (8%) while Social dimension accounted for 10% of the total interactions. Expository dimension involves demonstration of knowledge/facts without much further elaboration, while explanatory dimension refers to elaborate explanation on knowledge and developed content based on learner’s response. It was observed that learners have utilized the online forums mostly for seeking understanding on course concepts and knowledge of the subject matter. However, exchanges at the Cognitive dimension which involves providing constructive feedback and detailed commentary on course content via critical thinking which leads to knowledge development were lacking. In addition, it was found that the most active thread in the Public Forum has 32 ensuing replies and the interval between responses was an average of 5 hours. As for the Tutorial Group Forum, the interval between replies was observed to be 31 hours on average. This evidently substantiate the fact that the learners prefer to interact in the Public Forum rather than the specific Tutorial Group Forum.

![Figure 5: Dimensions of Interactions in the Online Discussion Forums](image)

Figure 5: Dimensions of Interactions in the Online Discussion Forums
6.3 Summary of findings from interview sessions with learners

In addition to the survey and content analysis discussed above, interview sessions were also conducted with 15 representatives from the same group of learners to gather more in-depth understanding on their expectations and concerns with regard to WOU learning management system, WawasanLearn. Findings from the interview sessions were analysed along key themes associated with the quality concerns in online LMS, i.e. institutional, technology, faculty (course coordinators and tutors), instructional design and pedagogical factors.

The learners interviewed were generally satisfied with the technical aspects and the provision of online teaching and learning in WawasanLearn. They have also highlighted that the main strength of WawasanLearn which is the accessibility of the web-based platform which can be readily accessed from anywhere at anytime. This feature is able to cater to the needs of the working adults where their study or learning hours varies based on personal, job or family commitments. Besides that, the bandwidth has been increased from 2 megabits per second (mbps) since the January 2007 semester to 6 mbps of the current semester.

However, several issues were brought up by the learners being interviewed. The learners commented that the layout of the page, placement of the online materials and navigation within the discussion topics in the online forums need to be refined. They have suggested that the layout of the page should be simplified while the online resources should be placed in a more systematic and structured way so that information can be retrieved at a glance. While the content published enables information dissemination, learners have also highlighted that some of the content posted were not updated accordingly and may create ambiguity. In addition, there were also concerns raised which relates to several ethical issues where in certain cases WawasanLearn was used as the platform for personal agenda.

Learners have also indicated their concern on the responsiveness of some academic staff in addressing the questions they have posted in the online forums. Some of the staff and a number of learners were not active in the forums and this has dampened the enthusiasm as well as motivation of the learners to participate in the online environment. Learners have also suggested that academic staff should post more interesting materials and initiate thought provoking discussion topics related to the assignments of the course to increase higher participation rate of the learners. Some learners were of the opinion that a number of materials posted for certain courses were not directly related to the course content.

Along with the dimensions of service quality identified earlier, the actual activities of learners in the online learning environment, as well as the qualitative feedback from learners discussed above were taken into account in developing the appropriate QA components for web-based teaching and learning in the context of WOU.
6.4 Application of Quality Assurance Components in the Online LMS of WOU within the Overall QA Framework

Addressing the various facets of QA components in web-based education identified, WOU has developed QA measures for the online teaching and learning activities as part of its overall QA framework. The development of these QA processes is in-line with the institution’s vision, mission and the key areas specified in its quality policy. The QA components for web-based teaching and learning on the online LMS are documented in the Standard Operating Procedures (SOP) for WOU Learning Management System (WawasanLearn). In addition to sections on administrative matter and processes related to WawasanLearn, the SOP detailed several key components of QA on teaching and learning in the web-based system aiming at delivering quality service in the online environment to its clients, i.e. the open distance learners.

In the SOP, the purpose of WawasanLearn in supporting a collaborative learning community, offering multiple modes of learning - from self-paced coursework (web-based seminars and classes, downloadable, audio and video contents) to group learning (online forums) thus creating the most comprehensive learning experience is first explained.

In the aspect of governance in the online LMS, the main stakeholders of WawasanLearn (i.e. administrators comprising education technologist, IT support staff, course coordinators, tutors, students etc.) and the key areas of responsibilities of each stakeholder are clearly outlined. In addition, the rights and privileges of each stakeholder are stated in a comprehensible manner. The workflow involved in granting access to WawasanLearn is depicted in flowcharts with quality objectives specified in the key processes. These flow charts illustrate the processes from the perspective of students, tutors, course coordinators, as well as other users/staff.

Next, a detailed list of processes involved in setting up of WawasanLearn is presented to elaborate the steps in setting up the system for every new semester. Several quality concerns, particularly of accuracy and timeliness, are being addressed.

While the layout of WawasanLearn has been standardized across courses for more structured view and easy navigation, specification of materials and content in WawasanLearn is also established. In particular, Course Coordinators are required to populate their respective course(s) every semester a week prior to the commencement of the semester with items such as course overview, TMAs questions and samples of marked TMAs, specimen exam papers, supplementary course materials etc.

A quality objective has been set for turnaround time in responding to learners’ question posted in the online forums. All queries posted in the online forums should be responded within 48 hours. Besides, a detailed guide on posting a web or text page, as well as on the clarity and appropriateness of online materials are also provided to the academic staff.
Furthermore, rules and ethics involve in using WawasanLearn have also been developed for adherence by all users of the online LMS platform.

Finally, the activities and specific role of stakeholders involved in updating, upgrading and maintenance of WawasanLearn are elaborated as well.

6.5 Assessment of Learners’ Satisfaction in the web-based teaching and learning on WawasanLearn

In closing the loop of a comprehensive quality management system, students’ evaluation through feedback form and student dialogue sessions are conducted at the end of every semester in WOU. Survey questionnaires forms are administered to students which solicit feedback and evaluation on the quality of all aspects of the delivery of open distance education and student support services. These aspects include section to gauge students’ satisfaction level on the quality indicators of the online LMS. An investigation of the results obtained from the students’ evaluation of semesters in year 2010 showed improvement in all items related to WawasanLearn in the questionnaire. Similar response was also gathered from students on the provision of learning support via LMS during the dialogue session.

7.0 Conclusion

This study identified and presented several important aspects of quality assurance issues of key services closely associated with the web-based teaching-learning in the online LMS. In particular, the importance of learners’ expectation and needs, along with the actual behaviour observed in the web-based environment provide a holistic view in identifying quality components associated with the online LMS. The lessons learnt from this case study put forward recommendation for open universities on the integration of QA components within the web-based teaching learning in their overall institutional QA framework.

As a concluding remark, to ensure that the quality of the student learning experiences via the LMS is not compromised quality assurance mechanisms and measures such as staff training and development in the pedagogical and technical aspects of online teaching and learning need to be implemented as well as the evaluation of student experience and learning outcomes.
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