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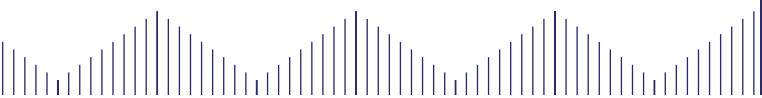
THE LEVEL OF NPQEL PARTICIPANTS' INTERACTION IN THE E-LEARNING PORTAL AND ITS RELATIONSHIP WITH THE PARTICIPANTS' ACHIEVEMENT

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Abstract: The e-Learning phase encompasses 70% learning hours of the National Professional Qualification for Educational Leaders (NPQEL) course at the Aminuddin Baki Institute (IAB), thus it plays a major role in determining the quality of the course. During the e-Learning phase, the participants of NPQEL course have the opportunity to interact with the contents of the course, other participants, and the lecturers. The objectives of this paper are to identify the level of NPQEL participants' interaction in the e-Learning portal and to determine the relationship between the level of interaction and the participants' achievement. The sample of the study consisted of 394 NPQEL participants. The research design used for this study was the Explanatory-Mixed-Method-Design. Data were collected by means of questionnaires, open-ended questions, interviews, and online data analyses. Overall, the results showed that the participants had a high perception on their level of interaction in the e-Learning portal. The results also showed that only the interaction between the participants and the contents had significant relationship with the participants' achievement. Qualitative data analysis has not only provided clarifications about the situations being studied but also contributed ideas for the improvement of the contents and delivery approach to enhance the quality of the overall interaction in the e-Learning portal.

Keywords: *e-Learning; learner-content interaction; learner-learner interaction; learner-teacher interaction*

INTRODUCTION

Institut Aminuddin Baki (IAB) is a training institution under the auspices of the Ministry of Education Malaysia. IAB is responsible for providing training to MOE staffs in the field of Educational Leadership and Management. One of the key training programs at IAB is the National Professional Qualification for Educational Leaders (NPQEL) which provides training for future school leaders. The programme was first introduced in 1999 with the name National Professional Qualification for Headship (NPQH). In 2008, the name of NPQH was changed to NPQEL as several values were added, and the duration of implementation as a one-year programme was set. In 2011, the New Mode NPQEL Programme using the Blended-Learning approach was introduced. The programme includes a combination of three approaches, namely: (i) face-to-face learning at IAB (ii) online distance learning (e-Learning phase) from the course participant's workplaces, and (iii) consultation programme. The span of the programme is 5 months, consisting of a 6-week face-to-face study and a 14-week e-learning course. During the fourteen weeks, participants also need to engage in two consultation programmes, namely (i) a two-week benchmarking programme, and (ii) an eight-week attachment programme. The e-Learning phase is implemented through the IAB e-Learning Portal, which contains course materials and various activities for the training and assessment of participants. Course materials are in the form of lecture notes, circulars, scholarly articles, and videos. Meanwhile, e-Learning activities and assessments are in the form of discussion forums, self-reflection, quizzes, and assignments. As the e- Learning phase is closely related to the quality of NPQEL courses at IAB, the e-Learning contents and delivery approaches should be evaluated from time to time.

PROBLEM STATEMENT

As a leading establishment that organizes educational leadership training programmes for MOE, the IAB needs to assure that the NPQEL graduates have proper qualities to lead the schools. An initial criterion for measuring the quality of NPQEL graduates was their own respective achievements in the overall evaluation of the course. Out of the overall score of the course, the e-Learning phase accounts for 20%, while 40% of the marks come from the consultation programme and another 40% from the final test. Although

the e-Learning phase contributes only 20% of the overall NPQEL score, it massively includes 70% learning hours of the course. Thus, the e-Learning phase plays an essential role in providing critical elements to develop the quality of the course participants.

During the e-Learning phase, the participants of the course interact with the NPQEL course contents, other participants, and the lecturers. Numerous studies on e-Learning have shown a positive relationship between students' or participants' levels of e-Learning and their learning quality (Masarrah, Noor Dayana & Noraffandy, 2016; Kearsley, 2000; Merriam & Caffarella, 1999; Milheim, 1996) and the improvement of their respective achievements (Cook & German, 2010; Ramos and Yudko, 2008; Kay, 2006). However, after the e-Learning phase was introduced at IAB, the interaction levels of the participants of the course in the IAB e-Learning portal and how it is related to participants' achievements have not yet been evaluated.

Thus, the aim of this paper was to identify the levels of interactions of NPQEL participants in e- learning portals and the relationship to their achievements in NPQEL course evaluation. The results of the study were used to improve the contents and approaches of module delivery in the e-Learning portal to enhance the quality of the participants' interactions and thus contribute to the improvement of the quality of NPQEL courses and other courses at IAB from the e-Learning perspective.

LITERATURE REVIEW

Online learning, or better known as e-Learning, is often criticised because it offers limited face-to- face interactions (Kirby, 1999; Kruger, 2000; Benbunan-Fich, Hiltz &Turoff, 2003) as students and teachers are physically and remotely separated. Long-distance interactions in e-Learning can only happen with the help of technological tools and Internet connection. This situation becomes a barrier to communication (Sorensen and Beylen, 1999) and causes students to feel isolated (Weller, 2007) when engaging in e- Learning.

According to Thurmond (2003), interactions in e-Learning can be defined as students' engagements with course contents, other students, teachers, and technological media used in the courses that can produce two-sided

exchanges of information. He maintains that the exchange of information is crucial for students to improve the structuring of knowledge in their learning environment and enhance understanding of the course contents or mastery of learning objectives that have been set.

Thurmond's opinion is supported by Thomassen & Ozcan (2010), who reaffirm that the principle of interaction cannot be overlooked in the attainment of learning goals because the flow of information between course participants contributes significantly to the learning process. Hrastinski (2009) points out that online learning takes place through a complex process that requires the engagements and interactions of participants with the digital environments available.

Many experts have categorized interactions in e-Learning into four types, namely student-student, student-lecturer, student-content, and student-interface (Hillman, Willis & Gunawardena, 1994; Moore, 1989). Meanwhile, Chou et.al (2010) classifies e-Learning interactions into five types, namely student-lecturer, student-student, student-content, student-interface, and student-him/herself. These five types of interactions are mentioned as able to involve participants actively in e-Learning. Anderson (2003) further classifies interactions into six categories based on the Modes of Interactions in Distance Education Model (Anderson & Garrison, 1998), as shown in Figure 1. The categories of interactions that Anderson discusses are student-student, student-lecturer, student-content, lecturer-lecturer, lecturer-content, and content-content.
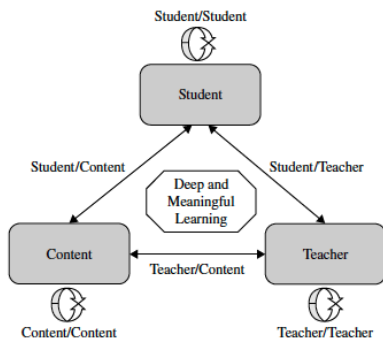

Figure 1: Modes of Interactions in Distance Education Model by Anderson & Garrison (1998)

Numerous studies on online interaction have been carried out based on Moore's (1989) three categories of interactions, namely student-content, student-student and student-lecturer. The discussions in the following section will focus on the three types of students' interactions used in this current study, namely student-content interactions, student-student interactions, and student-lecturer interactions, as suggested by Moore (1989) and adapted from Anderson (1998).

3.1. Student-Content Interactions

Moore & Kearsley (1996) define student-content interactions as a consequence of student's reading and research activities on course contents/materials and students' involvement in the activities implemented. Among the factors that influence students' perceptions of course contents are their constant relationships with course contents (Leasure, Davis & Thievon, 2000); precise designs of course contents (Swan, 2001); time/duration of interactions with course contents (Atack & Rankin, 2002); involvement in online discussions (Jiang & Ting, 1999); and delivery mode of course contents (Faux & Black-Hughes, 2000). Studies carried out on these factors have confirmed the results that students' interactions with course contents improve students' achievements (Cook & German, 2010; Ramos and Yudko, 2008; Kay, 2006).

3.2. Student-Student Interactions

Online learning limits the physical interactions of students with other students, and this may affect their learning (Beard & Harper, 2002). Studies reported that students are required to perform four actions to ensure effective online learning, namely (a) engage, (b) respond, (c) give effective feedback, and (d) write a short, focused message. Students also need to be encouraged to carry out collaborative learning via group assignments to enhance their understanding of course contents, stimulate critical thinking, overcome the sense of aloneness while partaking in online learning, and promote a learning community (Abrahamson, 1998; Palloff & Pratt, 2001). Findings from various studies revealed that students who make online interactions experience more productive and more beneficial learning (Masarrah,

Noor Dayana & Noraffandy, 2016; Kearsley, 2000; Merriam & Caffarella, 1999; Milheim, 1996).

Additionally, Grandzol and Grandzol (2006) pointed out that the most important matter in online learning is students' interactions to create virtual communities in which interactions between members of the learning community that are numerous and of high quality may enhance students' participations in learning activities. The creation of a thriving virtual community makes students feel the "emotional and personal attachment to the subject, teachers, and peers" in the virtual community. Such attachments are necessary to enhance students' discipline to participate in online learning (Clark-Ibanez and Scott, 2008). In their research on the social environment in online learning, Summers et al. (2005) maintained that good online social relationship determines good learning.

3.3. Student-Lecturer Interactions

Lecturers/facilitators' roles in online courses are different from face-to-face courses. In face-to-face courses, lecturers are the centre of learning, while in the online learning environment, lecturers play the role of a facilitator (Gutierrez, 2000). Literature studies on student-lecturer interactions are often linked with different variables, such as face-to-face meetings, immediate feedback, performance, and the presence of a lecturer in the learning setting. Most students appreciate their interactions with lecturers (DeBourgh, 1999; Jiang & Ting, 1999; Thurmond et al., 2002). Thurmond et al. (2002) found that students who thought they knew their lecturers through interactions, were more actively involved in online conversations, and thought that the courses they attended gave them numerous ways to access learning.

Previous studies conducted on the roles of lecturers in e-Learning have also shown similar findings. As an example, the research of Brandon and Hollingshead (1999) states that the role of lecturers' encouragement on students' participation in online learning activities can increase the levels of students' engagement in learning activities. Besides, on the factors that influence students to fail in online courses, a study by Nash (2005) maintains that lecturers need to be exposed

to the requirements and methodologies of online learning. Conrad and Donaldson (2004) emphasize that the most significant role of lecturers when conducting e-Learning is to ensure students' intense engagement and interaction in online activities. This can be attained by intensifying online interactions between lecturers and students, increasing the role of lecturers in participating in discussions, and using reflective learning approaches (Rabe-Hemp et al., 2009). Meanwhile, Palloff and Pratt (2005) propose that the support and cooperation of lecturers who participate as members of the learning community in online discussions will help students become more adept in managing their learning.

In conclusion, studies related to the investigation of interactions in e-Learning show a positive relationship between the levels of interactions by students (course participants) in e-Learning with the quality of their learning and achievements. Therefore, this current study was carried out to investigate the levels of interactions of NPQEL participants in the e-learning portal and to identify whether there is a relationship between these levels of interactions and their achievements in NPQEL courses. The findings of the study will be used to improve the contents and approaches in the delivery of IAB e-Learning portals and further contribute to improve the quality of NPQEL courses and other courses in IAB from the e- Learning perspective.

RESEARCH METHODOLOGY

4.1. Research Design

This study uses Explanatory-Mixed-Methods Design in which qualitative data are used to provide a more extensive description of quantitative data findings (Creswell, 2008). According to Creswell (2008), qualitative data findings are used to refine quantitative data by exploring or explaining in-depth on specific cases.

4.2. Research Sample

The study population comprises the entire NPQEL New Mod Programme participants (students) from six years of intake (2011 – 2016) totalling over 6500 people. The study sample consisted of 394 NPQEL participants from intake 2/2016, who would be leaders in primary and secondary schools. Meanwhile, the minimum number to generalize the findings to a large population is 384 people (Krejcei & Morgan, 1970). The study sample was chosen using a random sampling method. The NPQEL participants answered the questionnaires completely via online after finishing the NPQEL course. Nine NPQEL participants from intake 2/2016 who were chosen as the study sample, were also selected as the study participants to answer the interview questions. All interviewees were selected based on identified criteria based on cases representing different situations of NPQEL participants from various perspectives.

4.3. Instruments and data

Quantitative data were collected using questionnaire. The questionnaire instrument used to measure participant-participant interactions and participant-lecturer interactions was adapted from equivalent instruments applied in previous studies (Sher, 2009; Johnson, Aragon, Shaik & Palma-Rivas (2000). Meanwhile, the questionnaire instrument to measure participant-contents interactions was developed by the researchers based on relevant constructs in previous studies. All items in this survey were measured using a Likert scale (1 = strongly disagree; 2 = disagree; 3 = strongly disagree; 4 = agree; 5 = strongly agree) to assess students' level of agreement on their level of interaction in the e-Learning portal. A pilot study was conducted to determine the internal consistency of all items in the questionnaire instrument used in this study. Data analysis showed that each attribute in the study instrument had an acceptable Cronbach's alpha value of greater than 0.90 ($\alpha \geq 0.90$).

Qualitative data were collected using open-ended questionnaires, interviews, and online data. Data analysis from open-ended questions and interviews were applied to render more detailed explanations about the practices of NPQEL participants as they engaged in e-Learning. The online data used were in the form of (i) an indicator of the

e-Learning activities of the participants, and (ii) the number of posts in the lecturer's forum. The data were obtained from the e-Learning Portal database.

Next, NPQEL Participant Achievement data were used to investigate the relationship between the levels of interactions of participants in the e-Learning portal with their NPQEL achievements. Data for achievements used were the overall achievement of the NPQEL participants comprising e-Learning assignments (20%), Final Examination of the Course, UAK (40%), Benchmarking reports, (10%) and Attachment Programme reports – including colloquium presentation (30%). Achievement data were measured using the Cumulative Grade Point Average (CGPA).

DATA ANALYSIS PROCEDURE

5.1   Quantitative data analysis procedure

Quantitative data were analysed using descriptive statistical analysis, namely mean and standard deviation. Quantitative data were processed using the Statistical Package for Social Science (SPSS 23 for Windows) software. Descriptive statistical analyses of quantitative data were presented in the forms of the mean and standard deviation to describe the feedback of the study sample about their level of interaction in the e-Learning portal.

Data obtained from the questionnaires and achievements of NPQEL participants were analysed using Spearman's Correlation Analysis to identify the relationship between the levels of interactions of NPQEL participants in the e-Learning portal with NPQEL achievement. Spearman correlation was used because both variables (participants' level of engagement in e-Learning and achievement) were in the form of ordinal data with the abnormal distribution. Data on the participants' interactions in e-Learning were measured using the Likert scale. Data on achievements were measured using the Cumulative Grade Point Average (CGPA).

5.2. Qualitative data analysis procedure

Qualitative data from open-ended questions and interviews were managed using Ms Excel (Windows) software. These data were then analysed using thematic analysis to produce matrix tables related to participants' habits during e-Learning. Online data were analysed to obtain the patterns of the participants' interactions in the e-Learning portal. Overall, qualitative data analysis was used to render a more profound understanding of the findings from the questionnaire concerning the patterns of participants' interactions in the e-Learning portal.

RESEARCH FINDINGS

The data from the questionnaire were analysed descriptively to obtain the distribution of the

consensus level by the study sample on their levels of interactions in the e-Learning portal in the form of mean scores and standard deviations. Table 1 shows the mean scores used to assess the levels of agreement of the study sample to their levels of interaction in the e-Learning portal.

Table 1: Interpretation of Mean Scores for the NPQEL Participants' Levels of Interactions in the e-Learning Portal

Mean Scores	Interpretation of Mean Scores
1.00 – 1.79	Very low
1.80 – 2.59	Low
2.60 – 3.39	Moderate
3.40 – 4.19	High
4.20 – 5.00	Very high

Besides, qualitative data from open-ended questions were examined using thematic analysis, while the online data were used to support the findings of the open-ended analysis. Both types of data were used to provide a more extensive explanation of the quantitative data on the levels of interactions of study sample in the e-Learning portal.

6.1   The NPQEL Participants' Levels of Interactions in the e-Learning Portal

6.1.1.   Participant – content interactions

The interaction levels of the study sample with the course contents in the e-Learning portal were evaluated through 9 items (items 1-9) based on participants' interactions with course materials (videos, reading materials, links, and references) and with online activities or assessments (quizzes, forums, and assignments). The levels of interactions for course participants with contents are "…on the extent to which it engages students in interaction…" (Anderson, 2003). Figure 2 shows a bar graph of mean scores to assess the levels of agreements for the study sample on their interactions with the course contents in the e- Learning portal.
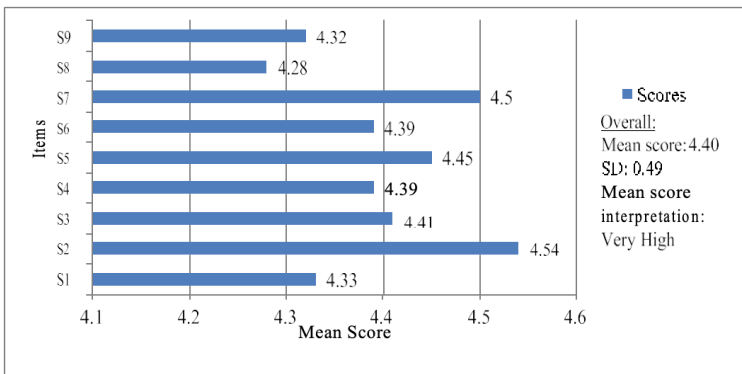

Figure 2: Analysis of the study sample on participant-content interactions

The evaluation of the study sample on their level of interaction with the course contents in the e- Learning portal (Figure 2) showed that all 9 items displayed a mean score value representing a very high level of agreement. The item that showed the highest level of agreement was item 2 (mean score = 4.54), which was about participants' involvement in answering the quiz questions. The item with the lowest level of agreement was item 8 (mean score = 4.28), which was about participants' use of links to get additional information. Overall, the findings show that the study sample provided a very high level of agreement (mean score = 4.40; SD = 0.49) to describe their levels of interactions with the course contents in the e- Learning portal.

6.1.2. Participant – participant interactions

Interaction levels of the study sample with other participants in the e-Learning portal were evaluated through 8 items (items 10-17). The levels of interactions were measured based on knowledge sharing, communication, giving/getting help, and creating virtual communities. Figure 3 shows a bar graph for mean scores to evaluate the agreement level of the study sample of their interactions with other participants in the e-Learning portal.
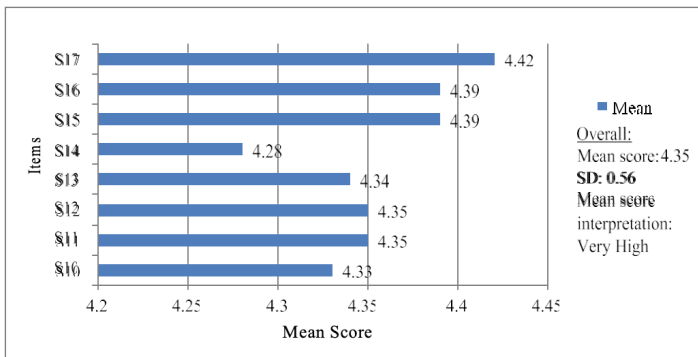

Figure 3: Analysis of the study sample on participant-other participant interactions

The evaluation of the study sample on their level of interaction with other course participants in the e-Learning portal (Figure 3) showed that all 8 items displayed a mean score value representing a very high level of agreement. The item with the highest level of agreement was item 17 (mean score = 4.42), which was related to the perceptions of the study sample on the co-existence of teamwork. The item with the lowest level of agreement was item 14 (mean score = 4.28), which was about the potential of positive feedback to motivate participants to continue to share their views in the forum. Overall, the findings show that the study sample provided a very high level of agreement (mean score = 4.35; SD = 0.56) to describe their levels of interactions with other participants in the e-Learning portal.

6.1.3. Participant – lecturer interactions

Interaction levels of the study sample with the lecturer in the e-Learning portal were evaluated through 6 items (items 18-23). The levels of interactions were measured based on the aspects of encouragement, responses, and assistance/facilitation for the participants of the course. Figure 4 shows a bar graph for mean scores to evaluate the agreement level of the study sample of their interactions with the lecturer in the e-Learning portal.

Figure 4: Analysis of the study sample on participant-lecturer interactions

The evaluation of the study sample on their level of interaction with the lecturer in the e-Learning portal (Figure 4) showed that the items that showed the highest level of agreement was item 22 (mean score = 4.43), which was related to the lecturer reminding the participants about important dates in carrying out the e-Learning activities. The item with the lowest level of agreement was item 19 (mean score = 4.06), which was related to the lecturer providing feedback on the participants' output of the assignments in the e- Learning. Four out of six items showed mean score value representing a high level of agreement while two more items showed mean score value representing a very high level of agreement. Overall, the findings show that the study sample provided a very high level of agreement (mean score = 4.20; SD = 0.64) to describe their levels of interactions with the lecturer in the e-Learning portal.

Overall, it can be concluded that the three types of levels of interactions for the study sample in the e-Learning portal are either high or very high. However, the level of interaction for participant-lecturer was relatively low compared to the other two types of interactions. The quantitative findings of this survey are further strengthened by the findings from the online data analysis.

The findings of the online data analysis (analysis of the indicators for participants' e-Learning activities implementation) showed a high percentage of 88.2% to describe the participants who completed all of the module activities. This high percentage supports the quantitative data findings that showed a high level of interactions for participant-content and participant-participant (through forums) in the e-Learning portal.

However, the findings from the analysis on the number of posts in the forum by the lecturers showed a very low percentage of lower than 20%, indicating that the participant-lecturer interaction in the e-Learning portal was low. This finding was contrasted with the findings of the quantitative analysis from the participants' questionnaires that found high levels of participant-lecturer interactions in the e-Learning portal. A high level of perceptions of the participants on the level of participant-lecturer interactions was most likely due to the fact

that many student-lecturer interactions took place through other online applications. This statement was based on the results of the qualitative analysis of participant-lecturer interactions indicating the study sample suggested that student-lecturer interactions also occurred through online applications such as email, Google Apps, phones, and WhatsApp application.

The qualitative findings related to participant-content interaction and participant-participant interaction provided further insight into the types of activities that participants liked and how the participants' interactions in each of these activities helped them improve their learning through the IAB e- Learning portal.

The qualitative findings of the participant-content interaction found that the study sample was very interested in quiz activity, followed by forum activities, assignments, and course materials. The study sample suggested that quiz activities could (i) challenge the mind, test comprehension, and increase content knowledge; (ii) simple, brief, and fast; (iii) provide answer choices, allow quick feedback, allow multiple attempts, and (iv) assist in the Course End Exam (UAK). Overall, the findings show that the theme of "increasing understanding and knowledge (of course content)" was reflected in every e-Learning activity which was chosen at a high percentage level.

Furthermore, the qualitative findings of the participant-participant interactions showed that the study sample selected the forum as the e-Learning activity that was the most encouraging for their interactions with other participants. The study sample argued that, through forum activities, they could (i) share ideas, opinions and experiences collaboratively; (ii) hold discussions; (iii) interact and develop good relationships with other participants; (iv) increase knowledge, and (v) get interactive feedback. Overall, the themes covered were that participants in the e-Learning portal were focused more on social purposes, such as sharing ideas, opinions, and experiences, discussing and establishing good relationships with other participants to help each other in their learning.

6.2   The relationship between the level of interaction in e-Learning and achievements in NPQEL

The data from the questionnaires and the data from NPQEL participants' achievements were analysed using Spearman's Correlation analysis to identify the relationship between the levels of interactions of NPQEL participants in the e-Learning portal with NPQEL achievements.

6.2.1 Relationship between participant-content interaction levels and NPQEL achievement

Table 2 Correlation analysis of the levels of interactions of participant-content with NPQEL Achievements

			NPQEL Achievement	Participant-contents
Spearman's rho	NPQEL Achievement	Correlation index, r	1.000	.158**
		Sig. (2- tailed), p	.	.002
		N		394	394
	Participant-contents	Correlation index, r	.158**	1.000
		Sig. (2- tailed), p	.002	
		N	394	394

**. The correlation was significant at the $\alpha = 0.01$ level (2-tailed) meaning.

Table 2 shows that there was a significant relationship between the levels of participant-content interactions in the e-Learning portal with NPQEL achievement where the significant value, $p = 0.002$ was lower than the significant level, $\alpha = 0.01$ in the two-tailed correlation test. The correlation index was at a low positive of $r = 0.158$. A positive correlation index value indicated that the relationship existed between the two variables was a positive relationship. This means that the probability of achievements of NPQEL participants would be high if they practice high levels of interaction with the course contents in the e- Learning Portal.

6.2.2. Relationship between participant-participant interaction levels and NPQEL achievement

Table 3: Correlation analysis of the levels of interactions of participant-participant with NPQEL Achievements

			NPQEL Achievement	Participant - Participant
Spearman's rho	NPQEL Achievement	Correlation index, r	1.000	.049
		Sig. (2-tailed), p	.	.333
		N	394	394
	Participant-Participant	Correlation index, r	.049	1.000
		Sig. (2- tailed), p	.333	.
		N	394	394

Table 3 shows that there was no significant relationship between the levels of participant- participant interactions in the e-Learning portal with NPQEL achievement where the significant value, $p = 0.333$ was higher than the significant level, $\alpha = 0.01$ in the two-tailed correlation test. This means that the levels of interactions of NPQEL participants with other participants in the e-Learning portal did not affect their achievement.

6.2.3. Relationship between participant-lecturer interaction levels and NPQEL achievement

Table 4: Correlation analysis of the levels of interactions of participant-lecturer with NPQEL Achievements

			NPQEL Achievement	Participant - Lecturer
Spearman's rho	NPQEL Achievement	Correlation index, r	1.000	-.004
		Sig. (2- tailed), p	.	.939
		N	394	394
	Participant - Lecturer	Correlation index, r	-.004	1.000
		Sig. (2- tailed), p	.939	.
		N	394	394

Table 4 shows that there was no significant relationship between the levels of interactions between participant-lecturer in the e-Learning portal with NPQEL achievement where the significant p-value = 0.939 and was higher than the significant level, α = 0.01 in the two-tailed correlation test. This means that the levels of interactions of NPQEL participants with the lecturer in the e-Learning portal did not affect their achievement.

Overall, it can be concluded that only the levels of interactions of participants with contents in the e- Learning portal which significantly affected the achievements of the NPQEL study sample. Meanwhile, the levels of interactions of participant-participant and the levels of interactions of participant-lecturer did not affect the achievements of the NPQEL study sample.

DISCUSSION

7.1. The level of interaction of participants in the e-Learning portal

Interaction in e-Learning can be defined as students' engagement with the course contents, other students, teachers and the technological media used in the course. The real interactions with other students, teachers, and technology result in two-way information exchange. Exchange of information is essential to improve knowledge restructuring in the learning environment (Thurmond, 2003). The principle of interaction should not be overlooked to fulfil the purpose of learning because the flow of information between course participants contributes to the learning process (Thomassen & Ozean, 2010). Interaction was categorized into three types in this study, namely (i) participant-content interactions, (ii) participant- participant interactions, and (iii) participant-lecturer interactions.

7.1.1. Participant-content interactions

The findings showed that the level of participant-content interaction was very high in the e-Learning portal. The qualitative findings of the participant-content interaction discovered that the study sample was very interested in quiz activities, followed by forum activities,

assignments, and course materials. The study sample suggested that quiz activities could (i) challenge the mind, test comprehension, and increase content knowledge; (ii) simple, brief, and fast; (iii) provide answer choices, allow quick feedback, allow multiple attempts, and (iv) assist in the Course End Exam (UAK). Overall, the findings showed that the theme of "increasing understanding and knowledge (towards course content)" was reflected in each e-Learning activity selected at a high percentage. This implies that participant-content interaction in the e-Learning portal contributes to increasing participants' understanding and knowledge of course content. This finding was in line with the findings of other studies that have found that students who interact more online have a more effective and quality learning experience (Masarrah, Noor Dayana & Noraffandy, 2016; Kearsley, 2000; Merriam & Caffarella, 1999; Milheim, 1996).

Numerous studies have been conducted on participant-content interactions. It has been found that among the factors that influence students' positive perception of course contents are their constant relationship with course contents (Leasure, Davis & Thievon, 2000); precise designs of course contents (Swan, 2001); time/duration of interactions with course contents (Atack & Rankin, 2002); involvement in online discussions (Jiang & Ting, 1999); as well as delivery mode of course contents (Faux & Black- Hughes, 2000).

These studies have shown that the aspects related to the quality of the online course contents are closely related to the needs and requirements of participants. Accordingly, the findings of the study on participant-content interactions can serve as a source for creating the types of e-Learning content that participants enjoy to promote interactions between participants and high-quality content in the e-Learning portal in the future, as well as improve their knowledge of the course content.

7.1.2. Participant- participant interactions

Concerning the interactions of participants, the findings indicated that the levels of interactions were very high. Analysis of qualitative data from open-ended questions indicated that the study sample selected the forum as an e-Learning activity that most promotes

their interaction with other participants. The study sample argued that, through forum activities, they could (i) share ideas, opinions, and experiences collaboratively; (ii) hold discussions; (iii) interact and develop good relationships with other participants, (iv) increase knowledge, and (v) get interactive feedback. Overall, the themes reflected the interactions of participants in the e-Learning portal were more focused on social goals or "virtual learning communities", which were to share ideas, opinions, and experiences; hold discussions; and develop good relationships with other participants; rather than the purpose of "enhancing knowledge".

Numerous studies support the findings of participant-participant interactions that lead to social goals based on the supportive aspects of the virtual learning community. Some of these studies have found that a sense of community could be measured based on the individual's sense of cohesion and awareness of others within the community. An individual's sense of cohesion creates emotional relationships such as love, caring and relationships among members of the learning community (Abedin et al., 2010). Furthermore Jonassen (1999), Reigeluth (1999) and Martin & Reigeluth (1999), found that to maintain a positive relationship, community members needed to have empathy for each other and provide emotional support. This finding is in line with a study by Milheim (2012) that discusses the value of connection among community members and the value of caring can be enhanced through pedagogical design that promotes collaborative activity, presence of virtual mentors, personalized feedback, creating a learning community, and using application software for communication.

Support for the virtual learning community is critical to increase students' engagements in e- Learning. This is supported by a study by Grandzol & Grandzol (2006) who found that the most significant matter in online learning was creating a virtual community in which the quantity and quality of interaction between members of the learning community can enhance students' participations in learning activities. Creating a successful virtual community will enable students to feel the "emotional and personal attachment to their subjects, teachers, and peers" in the virtual community. Such relationships are important

to enhance the discipline of students in partaking in online learning (Clark-Ibenez and Scout, 2008). Also, a study by Summers et al. (2005) on the social environment in online learning found that good online social relationships affected good learning achievement.

As participants' interactions enhance participants' involvement in e-Learning, it is important to design e-Learning activities that support these interactions. Thus, the findings of this study can serve as a source to identify the types of forum questions/assignments that can improve the quality of participants' interaction in the e-Learning portal, which also provides a chance for them to increase their knowledge of the course contents.

7.1.3. Participant-lecturer interactions

The results of the qualitative analysis of open-ended questions for participant-lecturer interaction showed that the study sample indicated none or very little interactions with the lecturers through the e- Learning portal. Other research samples indicated that lecturer-participant interactions occurred through forums and through online applications, such as emails, Google Apps and WhatsApp/Telephone. The findings described that the quantitative data of the questionnaires found high levels of participant-lecturer interactions, which did not actually happen through e-Learning portals but through other online applications.

The findings of the study also showed that through participant-lecturer interaction, participants received (i) lecturers' assistance regarding e-Learning assignments; (ii) lecturers' supervision of the benchmarking, backup, and preparation programs for colloquial presentations and (iii) lecturer's assistance in understanding the contents of the NPQEL module. Besides, the interviewees contributed valuable suggestions on the interaction of lecturer participants; (i) lecturers should be more active in providing feedback and more helpful to participants who lack confidence and lack of ICT skills, and (ii) lecturers should be active during a specific time that can be set in advance. This finding is supported by Salmon (2000) who found that e-Learning lecturers needed to provide encouragement to passive

learners to ensure that dropouts did not occur and to become "technical experts" to assist students in technical aspects such as accessing the system, downloading files, inserting graphics, videos, and others.

Active engagement of lecturers can stimulate students' engagement. This is supported by a study carried out by Brandon & Hollingshead (1999), who found that the role of lecturers in encouraging students to participate in e-Learning activities could increase the levels of students' engagement in the learning activity. This finding is in line with the study by Conrad & Donaldson (2004), who also found that the most important role of e-Learning lecturers was to ensure active engagement and interactions in online activities. This can be achieved when lecturers join in discussions and use reflective learning approaches (Rabe-Hemp et al., 2009). Furthermore, a study by Palloff & Pratt (2005) also found that the involvement of virtual mentors as members of the learning community in forums and discussions had assisted students in being more skilful in managing their learning.

Consequently, the findings of this study can serve as the source for identifying and proposing (i) the role of lecturers as e-facilitators in the e-Learning portal, and (ii) the role of institutions in promoting the involvement of lecturers as e-facilitators who contribute to the enhancement of high quality online interactions.

7.2. Relationship between the levels of interactions by participants in the e-Learning Portal with NPQEL achievements

The findings showed that only the levels of interactions of the participants with the contents in the e- Learning portal that affected the achievements of the NPQEL study sample. Meanwhile, the levels of interactions of participant-participant and the levels of interactions of participant-lecturer did not influence the achievements of the NPQEL study sample. The findings were attributed to the qualitative data analysis that found that participant-content interactions generally improved the comprehension and knowledge of the study sample on course contents. This implied that participant-content interactions in the e-Learning portal contributed to the increase in participants' comprehension and knowledge of course contents, which indirectly

helped them to enhance their achievement.

The findings of this study were almost similar to the findings of Song and McNary (2011), which found no positive relationship between students' engagements in e-Learning and their levels of achievements. In their study, Song and McNary (2011) resolved that a positive relationship between students' engagements in e-Learning may be due to interaction quality rather than the quantity of interaction. This implied that it was possible that the interactions of participant-participant and lecturer-lecturer interactions in e-Learning in IAB had not yet reached the expected quality and that further efforts for improvements are necessary.

Some studies showed that students who interacted a lot online experienced more effective and quality learning in their learning (Masarrah, Noor Dayana & Noraffandy, 2016; Kearsley, 2000; Merriam & Caffarella, 1999; Milheim, 1996). However, other studies have found that there was a positive relationship between levels of students' (participants') interactions in e-Learning with their achievements (Cook & German, 2010; Ramos and Yudko, 2008; Kay, 2006).

Although the findings of this study indicated no positive relationship between participant-participant interaction level and participant-lecturer interaction level with NPQEL achievements in the study sample, qualitative data analysis findings showed that these two types of interactions helped participants in their learning in terms of idea sharing, opinions, and experiences as well as having discussions on learning materials. This indicated that the interactions of participant-participant and participant-lecturer can indirectly enhance participants' engagement in e-Learning activities and help to improve their achievements.

The findings are supported by other studies which have found that the quantity and quality of interactions among members of the virtual community (participant interaction) can increase not only students' participation in e-Learning activities (Grandzol and Grandzol, 2006), but also the discipline of students partaking in e-Learning (Clark-

Ibenez and Scout, 2008), which in turn impacts the achievement of good learning (Summers et al., 2005). However, studies on participant-lecturer interactions have found that active involvement by lecturers in e-Learning can stimulate students' engagement (Brandon and Hollingshead, 1999; Conrad and Donaldson, 2004; Rabe-Hemp et al., 2009) and can support students to become more skilled at managing their learning (Palloff and Pratt, 2005). In brief, abundant literature support the importance of these three types of online interactions, namely participant-content, participant- participant, and participant-lecturer, to contribute to the improvement of the quality of online interactions to enhance participants' learning and achievements in e-Learning. Therefore, numerous steps should be taken to improve the quality of participants' interactions in the IAB e-Learning Portal in terms of the interactions of participant-content, participant-participant, and participant-lecturer.

CONCLUSION AND SUGGESTIONS

The e-Learning phase comprises 70% learning hours of the National Professional Qualification for Educational Leadership (NPQEL) course conducted at the Aminuddin Baki Institute (IAB) and thus it plays a major role in determining the quality of the course. During the e-Learning phase, NPQEL course

participants can interact with course content, other participants and lecturer. The quality of participants' interactions in e-Learning enhances their learning activities and achievements. Therefore, this study is crucial to recognize the levels of interactions by participants in e-Learning so that actions can be taken to improve the quality of the interactions to provide quality and meaningful learning to the course participants. Overall, the findings showed that the levels of interactions of participant-content and participant- participant are high in the e-Learning portal, while the level of participant-lecturer interaction is low. It was found that most of the participant-lecturer interactions took place via Email, Google Apps, and phones and WhatsApp applications. The results showed that only the levels of interactions between participants and contents alone had a significant relationship with NPQEL achievements of the study sample. The analysis

of the qualitative data explains the situation under study and contributes to the improvement of contents and delivery approaches in order to improve the quality of participants' interactions in the e-Learning portal.

The findings of this study reflect the quality of participants' interactions in e-Learning. The review of the literature shows that all types of interactions under study, namely participant-content, participant- participant and participant-lecturer are important and have contributed to the increase of the quantity and quality of participants' interactions in e-Learning, and thus have enhanced their achievements. Subsequently, efforts must be made to enhance the contents and approaches of e-Learning to improve the quality of these three types of interactions, especially participant-lecturer interactions. The findings of the study discussed can serve as the basis for designing and restructuring of IAB e-Learning contents.

Thus, these are several suggestions to be implemented to improve the quality of IAB e-Learning:

> ï To provide Quality Standards for e-Learning Modules and Rubrics to evaluate e-Learning Modules approved and mandated in the development of an IAB e-Learning module.
> ï To establish e-Learning Technical Committee to monitor, review and appraise the e-Learning course/module development process according to the IAB e-Learning Module Quality Standards to ensure quality assurance of the course/module.
> ï To encourage lecturers' involvement in e-Learning by strengthening the IAB e-Learning Policy and taking into account the following issues:
> o   To establish the contributions and involvement of lecturers in e-Learning as a Key Performance Indicator (KPI) of the lecturers.
> o   To provide incentives to lecturers who make outstanding contributions to the development or implementation of e-Learning.
> o   To develop the capacity of IAB lecturers in implementing e-Learning (as a module builder/virtual facilitator) through periodic training.
> o   To monitor lecturers' competence indicators in implementing e-Learning.

ï To provide other quality documents related to e-Learning approved by the e-Learning Technical Committee.
ï To regularly conduct reviews on the quality documents related to the IAB e-Learning and e-Learning Policy.
ï To perform periodic research and development (R&D) for the purpose of continuous improvement of the IAB e-Learning.

E-Learning Module Quality Standards and the IAB e-Learning Policy need to be enforced in the implementation of the IAB e-Learning. With such action, the contents and approaches of delivery of IAB e-Learning will be enhanced. This situation can enhance the quality of participants' interactions and contribute to the improvement of the quality of NPQEL courses and other courses at IAB from an e-Learning perspective.

REFERENCES

Abedin, B., Daneshgar, F. & D'Ambra, J. (2010). Underlying Factors of Sense of Community in Asynchronous Computer Supported Collaborative Learning Environments. MERLOT Journal of Online Learning and Teaching 6(3): 585-596

Abrahamson, C. E. (1998). Issues in interactive communication in distance education. College Student Journal, 32, 33-42.

Anderson, T. & Garrison, D. R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), Distance Learners in Higher Education. (pp. 97-112). Madison, WI: Atwood Publishing.

Anderson, T. (2003). Modes of interaction in distance education: Recent developments and research questions. In M. Moore (Ed.), Handbook of Distance Education. (pp. 129-144). Mawah, NJ: Earlbaum.

Atack, L. & Rankin, J. (2002). A descriptive study of registered nurses' experiences with web-based learning. Jounal of Advance Nursing, 40, 457-465.

Beard, L. A. & Harper, C. (2002). Student perceptions of online versus on campus instruction. Education, 122, 658- 663.

Benbunan-Fich, R., Hiltz, S.R., & Turoff M. (2003). A comparative content analysis of face-to-face vs. asynchronous group decision making. Decision Support Systems, 34 (4), 457-469.

Brandon, D. P., and Hollingshead, A. B. (1999). Collaborative Learning and Computer Supported Groups. Communication Education Vol. 48.

Chou, C., Peng, H. Y. and Chang, C. Y. (2010). The technical framework of interactive functions for course- management systems: students' perceptions, uses, and evaluations. Computers & Education, vol. 55(3), pp. 1004-1017, 2010.

Clark-Ibanez, M. & Scott, L. (2008). Learning to Teach Online. Teaching Sociology 36: 34-41.

Conrad, R. & Donaldson, J.A. (2004). Engaging the Online Learner: Activities and Resources for Creative Instruction.
San Francisco: Jossey-Bass.

Cook, S. & Germann, C. (2010). The tell-tale data: Virtual whispering and final student grades. Retrieved from: http://kmeade.weblog.com/files/2010/03/technology-pdf.pdf.

Creswell, J. W. (2008). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. Upper Saddle River, NJ: Pearson/Merrill Education.

DeBourgh, G. A. (1999, February 28-March 4). Technology is the tool, teaching is the task: Student satisfaction in distance learning. Paper presented at the SITE 99: Sociey for Information Technology & Teacher Education International Conference, San Antonio, TX. (ERIC Document Reproduction Service No. ED 432226)

Faux, T. L. & Black-Hughes, C. (2000). A comparison of using the Internet versus lectures to teach social work history. Research on Social Work Practice, 10, 454- 466.

Gutierrez, J. J. (2000). Instructor-student interaction, USDLA Journal, 14(3). [Online] Avaiable: http://www.usdla.org/html/journa/MAROO Issue/ Instructorstudent.htm (July 13, 2015).

Grandzol, J. R., & Grandzol, C.J. (2006). Best Practices for Online Business Education. International Review of Research in Open and Distance Learning 7: 1-18.

Hillman, D. C., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. The American Journal of Distance Education, 8(2), 30-42.

Hrastinski, S. (2009). A theory of online learning as online participation. Computers & Education, 52, 78-82.

Jiang, M. & Ting, E. (1999, December 24-30). A study of students' perceived learning in a Web-based online environment. Paper presented at the WebNet 99 World Conference on the WWW and Internet, Honolulu, Hawaii. . (ERIC Document Reproduction Service No. ED 448721).

Jonassen, D. (1999). Designing Constructivist Learning Environments. In Reigeluth, C.M. (Ed.). Instructional Design Theories and Model: A New Paradigm of Instructional Theory (Vol. 111) (pp.215-241). Hillsdale, NJ: Lawrence Erlbaum Associates.

Kay, R. H. (2006). Developing a comprehensive metric for assessing discussion board effectiveness. British Journal of Educational Technology, 37(5), 761-783.

Kearsley, G. (2000). Online Education: Learning and Teaching in Cyberspace. Belmont, CA: Wadsworth.

Kirby, E. (1999). Building interaction in online and distance education

courses. Society for Information Technology and Teacher Education International Conference, 1999(1), 199-205.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30, 607-610.

Kruger, K. (2000). Using information technology to create communities of learners. In B. Jacoby (Ed.), Involving commuter students in learning, New Directions for Higher Education, (pp. 59-70). San Francisco: Jossey-Bass. Leasure, A. R., Davis, L. & Thievon, S. L. (2000). Comparison of student outcomes and preferences in a traditional vs. World Wide Web-based baccalaureate nursing research course. Journal of Nursing Education, 39, 149-154.

Martin, B.L. & Reigeluth, C. (1999). Affective Education and the Affective Domain: Implications for Instructional

Design Theories and Models. In Reigeluth, C.M. (Ed.). Instructional Design Theories and Model: A New paradigm of Instructional Theory (Vol. 111) (pp. 485-511). Hillsdale, NJ: Lawrence Erlbaum Associates.

Masarrah Abdul Mutalib, Noor Dayana Abd Halim, & Noraffandy Yahaya. (2016).

Meta-analysis on Interaction in Online Learning. RCEE Conf. Proc. 1, Universiti Teknologi Malaysia.

Merriam, S. B. & R. S. Caffarella. (1999). Learning in Adulthood: A Comprehensive Guide. San Francisco: Jossey- Bass.

Milheim, W. D. (1996). Interactivity and computer-based instruction. Journal of Educational Technology Systems
24(3): 225–233.

Milheim, K. L. (2012). Toward a Better Experience: Examining Student Needs in the Online Classroom through Maslow's Hierarchy of Needs

Model. MERLOT Journal of Online Learning and Teaching. 8(2): 159-171.

Moore, M. G. (1989). Editorial: three types of interaction. The American Journal of Distance Education, 3 (2), 1-6. Moore, M. G. & Kearsley, G. (1996). Distance education: A systems view. Belmont: Wadsworth

Publishing Company. Nash, R. D. (2005). Course Completion Rates among Distance Learners Possible Methods to Improve Retention.
Online Journal of Distance Learning Administration VIII (IV).

Palloff, R. M. & Pratt, K. (2001). Lessons from the cyberspace classroom: The realities of online teaching. San Franscisco: Jossey-Bass.

Palloff, R. M. & Pratt, K. (2005). Collaborating Online: Learning Together in Community. San Francisco, CA: Jossey- Bass.
Rabe-Hemp, C., Woollen, S. & Humiston, G. S. (2009). A Comparative Analysis of Student Engagement, Learning, and Satisfaction in Lecture Hall and Online Learning Settings. The Quarterly Review of Distance Education 10(2): 207-218.

Ramos, C., & Yudko, E. (2008). "Hits" (not "discussion posts") predict student success in online courses: A double cross-validation study. Computers and Education, 50(4),1174-1182. doi:10.1016/j.compedu.2006.11.003.

Reigeluth, C. M. (1999). Instructional Design Theories and Models: A New Paradigm of Instructional Theory (Vol.II). NJ: Lawrence Erlbaum Associates.

Salmon, G. (2000). E-moderating: The Key to Teaching and Learning Online. London: Kogan Page.

Song, L. & McNary, S. W. (2011). Understanding students' online interaction: analysis of discussion board postings.

Journal of Interactive Online Learning, vol. 10(1), pp. 1-12.

Sorensen, C. & Beylen, D. M. (1999). Interaction in interactive television instruction: Perception or reality. Paper presented at the Conference of the American Educational Research Association (AERA), Montreal, Canada.

Summers, J. J., Beretvas, S. N., Svinicki, M. D. & Gorin, J. S. (2005). Evaluating Collaborative Learning and Community. The Journal of Experimental Education 73(3): 165-188.

Swan, K. (2001), Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. Distance Education, 22, 306- 331.

Thomassen, A. & Ozcan, O. (2010). Standardizing interaction design education. Computer & Education, 4(54), 849- 855.

Thurmond, V. A., Wambach, K., Connors, H. R. & Frey, B. B. (2002). Evaluation of student satisfaction: Determining the impact of a Web-based environment by controlling for student characteristics. The American Journal of Distance Education, 16, 169-189.

Thurmond, V. A. (2003). Examination of interaction variables as predictors of students' satisfaction and willingness to enroll in future Web-based courses while controlling for student characteristics. Published Dissertation. University of Kansas. Parkland, FL: Dissertation.com. Available Online http://www.dissertation.com/library/1121814a.htm

Weller, M. (2007). The distance from isolation. Why communities are the logical conclision in e-learning? Computers & Education, 49, 148-159.