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The Relationship Between an Online Synchronous Learning Environment and Knowledge Acquisition Skills and Traits: The Blackboard Collaborate Experience

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Abstract: Online learning is becoming more attractive to perspective students because it offers them greater accessibility, convenience and flexibility to study at a reduced cost. While these benefits may attract prospective learners to embark on an online learning environment there remains little empirical evidence relating the skills and traits of knowledge acquisition with a synchronous online environment supported by Blackboard Collaborate. Without understanding this relationship colleges and universities cannot assess if their programs offered through educational communication technologies, such as Blackboard, enhance learner's skills and traits that are essential for knowledge acquisition. The purpose of this paper is to (i) examine the relationship between an online learning environment, which is supported by Blackboard Collaborate, and the skills and traits of knowledge acquisition, (ii) assess the influence of online learners motivation on knowledge acquisition skills and traits, and (iii) propose alternative Blackboard Collaborate layout and structure derived from the process of a critical reflection. Data was collected from 84 learners who studied online courses in a Higher Education Institution in the United Arab Emirates. The Analysis of Moment Structures (AMOS) was employed to perform the path analysis and SPSS was used to determine the factor structure of the examined variables. The study revealed three major findings. First, easy access of the Blackboard Collaborate and an effectively designed structure enhanced learners' problem understanding and communication. It also improved the personal traits of conceptualisation, tolerance and amiability that are essential for knowledge acquisition. Second, the readiness of the online learners with educational communication technologies had a positive influence on their liberal arts knowledge. Third, learners' attested motivation to embark on synchronous online classes enhanced their knowledge acquisition skills and traits. Finally, alternative Blackboard Collaborate layouts and structures are recommended aiming at encouraging future researchers to further investigate the relationship between the knowledge acquisition skills and traits of learners and an online synchronous learning environment.

Keywords: Blackboard collaborate; e-learners, online learning; knowledge acquisition; synchronous

1 Introduction

The survival and competitiveness of institutions and academics depends on their ability to continuously adapt to the educational virtual world because colleges and universities have expressed significant interest to offer degrees and courses via the Internet. Although Cruz et al. (2015, p. 27) argued that "We live the most collaborative experience since the beginning of the World Wide Web", the technological challenges and the inexperience of virtual educators hinder the effectiveness of online educational practices (Chen et al., 2008). The literature acknowledges that the online teachers should be equipped with unique experiences and skills in order to be effective virtual educators. It is argued by Davis et al. (2007, p. 28) that "effective virtual teachers have qualities and skills that often set them apart from traditional teachers". Moreover, it is argued that virtual educators should be highly motivated to embark on virtual teaching delivery, must understand the requirements of teaching in a synchronous online environment, and should be equipped with e-technologies and online communication skills (Barbour, 2012; Easton, 2003). Although it is suggested by some that the synchronous model of online teaching is consistent with face-to-face instruction and teachers deliver lectures in a familiar way (Surrey and Ely, 2007), the challenge is to identify what motivates students to positively engage in synchronous online learning (Barbour, 2012).

Therefore, the integration of technology into the synchronous online classroom in a pedagogical approach needs to be addressed through teachers' training in order to equip them with web-based knowledge and skills and online curriculum development (Davis, 2003), a view supported by Davis et al. (2007). Specifically, Davis and colleagues argued that very little emphasis is placed "on teaching and facilitation competencies for virtual

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school education" (2007, p. 27). In a period where most of the information is in a digital form, it can be argued that the "Internet and learning management systems and participation in communities of common interest, social networks and group tasks" (Brindley et al., 2009: p. 2) could assist in the creation and acquisition of knowledge (Tomas et al., 2015). Therefore, teachers need to reflect on their online synchronous teaching practices and identify shortcomings, which might impact learners' knowledge acquisition traits and skills (Lan et al., 2012). To the best of our knowledge, research is scarce in investigating empirically the relationship between online learners' knowledge acquisition skills and traits and the online learning environment supported via Blackboard Collaborate. Being online instructors for a number of years we are specifically interested to answer the following questions. (i) What is the perception of e-learners experiences on a synchronous online learning environment provided via Blackboard Collaborate?, (ii) Does the online learning experience enhance online learners' skills and traits for online knowledge acquisition?, and (iii) Can we identify deliberate Blackboard Collaborate layouts and structures to improve e-learners' knowledge acquisition skills and traits? The purpose of this paper is to empirically investigate the relationship between the structure of a synchronous online learning environment and learners' knowledge acquisition skills and traits. The synchronous online learning environment in this paper refers to the course content presentation; the structure supported via Blackboard Collaborate; the readiness to use instructional technologies, and the students' e-learning motivation. Moreover, the paper suggests an alternative synchronous online learning environment in order for future researchers to further investigate the relationship of the examined variables.

2 Selective Literature Review – Hypotheses Development

It is acknowledged that online learning is a fast growing sector of education (Cruz et al., 2015; Barbour, 2012). However, authors and practitioners question the quantity of interactivity (Brindley et al., 2009) and the quality of distance learning (Chen et al., 2008; Swan 2001). Some authors even argued that online education is inferior compared to that of face-to-face instruction, because they found more than one third (43.3%) of the Southern States academic leaders believe that "sacrificing quality results from moving instruction online" (Allen and Seaman, 2006, p. 12). Chen et al. (2008) however supports the quality of e-learning and face-to-face instruction are positively related with "student-faculty interaction, peer-to-peer collaboration and active learning" (para. 2). Therefore, it is important for online instructors to design and set-up the online learning environment that offers students/learners as much as possible the "face-to-face instruction, via intact classrooms and live, two-way audio-visual interaction" (Al-Arimi, 2014, p. 86). As a result the role of the instructor is to create and facilitate a collaborative online learning environment rather than being the communicator of a fixed body of teaching and tutorial material. An approach in establishing an online learning environment (i.e. synchronous online pedagogy) is to employ instructional technologies, such as Adobe Connect, Blackboard Collaborate, and/or BigBlueButton, which could simulate the traditional learning experience. Although synchronous pedagogy is dated back to the 1990's (Knox, 1997), a review of recent literature argued that there is limited discussion regarding as to how synchronous online learning technologies support effective learning (Asterhan and Schwarz 2010). A recent study however, provided some answers regarding the requirements for successful online learning. Specifically, Yamagata-Lynch (2014) conducted a study using synchronous meetings via Blackboard Collaborate and amongst other things she found that easy access to the lesson's website (reliable Internet) and deliberate course structure helped students to become effective course participants. Another study on 40 students at Victoria University, Australia, revealed that students experienced meaningful interactions and acquired 'higher order thinking skills' (Wdowik, 2014: p. 264) utilising Blackboard Collaborate. Although the structure of Blackboard Collaborate was not disclosed in Wdowik's study, it is reasonable to assume that accessibility to the Blackboard Collaborate and thoughtful structure for delivering online synchronous classes will be related to knowledge acquisition attributes of e-learners. This assumption is articulated into Hypothesis 1.

> *H1: Easy access and deliberate structure of Blackboard Collaborate will be positively related to knowledge acquisition attributes of online learners.*

Moreover, a review of the literature revealed that the challenges to utilise technology for knowledge acquisition/management are related to three phases of deployment, e.g., (i) set-up phase, (ii) the ongoing utilisation, and (iii) the long term effects of knowledge management support (Hahn & Subramani, 2000). The authors suggest the most important consideration in the set-up phase is balancing information overload and potential useful content. In the utilisation phase, the knowledge flow is an important issue, and the challenge is to balance additional workload and accurate content. A final issue raised is the long-term impact of the use of knowledge management systems on learning, innovation and experience development. Exploitation of existing solutions may be effective in the short term, but inhibit learning and innovation in the long term.

Therefore, the challenge for online instructors is to identify who are the participants and provide useful course content, which motivate collaborative and interactive learning (Brindley et al., 2009). Therefore, the course content and presentation of the online delivery should be designed to encourage learners participating in meaningful knowledge acquisition activities. Furthermore, the course content presentation should be supported by flexible synchronous communications technology (Yamagata-Lynch, 2014), because the technology could either motivate or frustrate learners.

As discussed earlier one of the instructional technologies employed to investigate the research questions is Blackboard Collaborate. Blackboard Collaborate offers innovative approaches to present the teaching content, which could intensely motivate learners towards online learning (Pengcheng et al., 2013). One could argue that virtual Blackboard is "an auxiliary tool for the class teaching and it is an extension and supplement of traditional blackboard" (Pengcheng et al., 2013: p. 4003). Moreover, it is being argued that if students required to dedicate more time to learn the content due to lack of immediate clarification of the online course content, that would hinder their learning process (Belcheir and Cucek, 2001). It is thus plausible the arrangement and classification of the material presented on Blackboard Collaborate for online learners (see Appendix I) would allow students to engage in a collaborative and active learning, leading to Hypothesis 2.

> *H2: The presentation and course content on Blackboard Collaborate will be positively related to knowledge acquisition attributes of online learners.*

However, the employment of full-featured Blackboard Collaborate instructional technology will not alone solve all the challenges of online learning and knowledge acquisition (Hendriks, 1999). Some characteristics of human behaviour (e.g. readiness) (Olesen and Myers, 1999) and knowledge itself (Hansen, 1999) could hinder or support the process of knowledge acquisition. Davenport et al. (1998) for example, in a study of successful knowledge management projects, identified eight essential factors that led to project success. One of Davenport et al.'s factors which is related to human behaviour, is the factor of 'change of learner's motivational practices'. It is thus essential for online learning and knowledge acquisition researchers to assess the motivation, readiness and technological skills of online learners (Lishon-Savarino, 2013). It is argued in the literature that effective online course participants are those who have become proficient with course communications technology (Yamagata-Lynch, 2014; Lishon-Savarino, 2013). Yamagata-Lynch (2014) for example in her online course found students need to be "prepared for synchronous sessions by having access to and properly set up computer equipment and USB headphone/microphone for each session" (2014, p. 199), and be knowledgeable as to how to use online technologies (Holley, 2002), views supported by Brindley et al. (2009). Moreover, it was argued that the synchronous platform could become "a clunky environment" without the technical proficiency of participants (Yamagata-Lynch, 2014, p. 198). It is thus reasonable to hypothesise that the readiness to use the instructional communications technology will be the predictive variable of knowledge acquisition skills and traits of online students, leading to Hypothesis 3.

> *H3: Readiness to use instructional communications technology tools will be positively related to knowledge acquisition attributes of online learners.*

Here it is essential to understand learners' motivations for choosing an online study. It is acknowledged that learners opt for an online study because it offers them greater accessibility, flexibility, and convenience (Henry et al., 2014). Provided learners are motivated, enthusiastic and eager to join online classes they would achieve successful online learning (Bromme et al., 2005). In addition, the employment of appropriate educational technology plays a significant role towards learning motivation. Studies showed that in technology rich classrooms students' performance was improved as well as their learning motivation (Yang and Wu, 2012). Moreover the creation of new knowledge is achieved when learners engage in online social interaction (Eryilmaz et al., 2013) and they are persistent towards online learning activities (Xie and Ke, 2011). Therefore, it is reasonable to assume that the enthusiasm and motivation for choosing an online study will be related to the skills and traits of knowledge acquisition of the online students. This assumption is articulated into Hypothesis 4.

> *H4: Students motivation towards online learning will be positively related to Knowledge acquisition attributes of online learners.*

The functional relationship of the above hypotheses are shown in the schematic diagram of Figure 1.

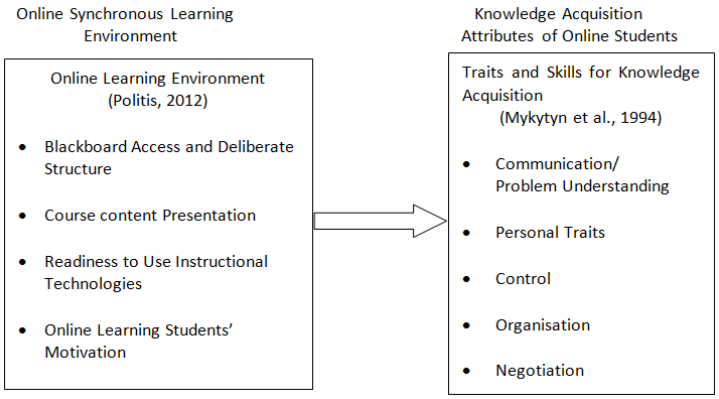

Figure 1: Summary of variables examined in the study

3 Research Methods and Sample

3.1 Analytical Procedure

The relationship of the examined variables was assessed through a survey. The latent structure underlying the set of variables investigated in this paper was examined through a factor analyses (FAs). Initial eigenvalues were examined to identify which observed variables are indicators of first order latent factors. Thereafter the first order latent factors were created and their reliability coefficient was computed, with $\alpha \geq .70$ been considered acceptable (Hair et al, 2011, p. 145). The reliability estimates were built into Munck's (1979) equations to compute both the regression coefficients (λ_i) and the measurement error variances (θ_i) associated with each latent construct. The λ_i and θ_i for the single latent construct were built in the structural equation model in order to test the hypotheses (Politis, 2001a; 2001b). In the causal modelling the covariance-based methods are exemplified by packages such as AMOS, LISREL, EQS and PLS-SME. AMOS' (Arbuckle, 2007) fit indices examined to evaluate the causal model fit. These are; the chi-square to degrees of freedom (χ^2/df) and the goodness-of-fit (GFI) and the adjusted goodness-of-fit (AGFI) indices (Joreskog and Sorbom, 1984), the comparative fit index (CFI) (Bentler, 1990), the normed fit index (NFI) (Bentler-Bonett, 1980), the incremental fit index (IFI) (Bollen, 1989), and the Tucker and Lewis (1973) index (TLI). Each of these indices should have values $\geq .90$, and the root mean square residual (RMR) should equal to .05 and the root mean square error approximation (RMSEA) should be equal to .08 in order to accept the casual model (Hair et al., 2009). In addition, the average variance extracted (AVE) was computed to test the convergent validity of the constructs under investigation. The AVE should be "equal or greater than .5" (Hair et al., 2011, p. 145) in order to accept convergent validity. The AVEs were computed using the factor loads generated from the factor analyses.

3.2 Sample

The sample was drawn from a Higher Education (HE) Institution in the UAE, which began offering a number of Engineering Management subjects through Blackboard Collaborate in February 2011. The e-learners were part-time students enrolled in the final year of a Bachelors program. Every online student was full time employed either in the private or public sector. Students' attendance was compulsory four hours per week over a period of 18 weeks. The size of the virtual classes was $22 \leq$ class size ≤ 28. The class size was determined by the Institutions' policy, which strictly prohibits classes being greater than 30. The lead author championed the synchronous online teaching delivery since February 2011 using synchronous Blackboard Collaborate virtual classroom. Appendix I depicts the delivery approach, content presentation, and the structure and layout of Blackboard Collaborate. The structure and layout of Blackboard Collaborate were consistent throughout the data collection period from February 2013 to June 2015. Questionnaires, written in English, captured e-learners' perceptions on their experiences of the online learning and the knowledge acquisition attributes.

The total sample consists of 84 online learners (yielding 82.2 percent response rate). Online learners had at least one semester experience with Blackboard Collaborate educational technologies. The respondents were 100 percent male because the survey was carried out at a Men's Campus. Approximately ¼ of the sample was in the 21-25-age range (21.4%), and 25% was in the 26-30-age range, whilst 44% was in the 31-35-age range. The respondents know the policies and educational procedures of their Institution very well because 63.1%

studied in the same Campus more than four years. As far as their engagement with online teaching educational technologies, 56% of the respondents have used the same Blackboard Collaborate layout and structure for a year, whilst the remaining 44% used it for two years. Moreover, 61.9% received training on Blackboard Collaborate from the Institution, whereas 38.1% learned Blackboard Collaborate through trial and error. Finally, all participants attained a diploma in engineering, which is a prerequisite to enrol in the Engineering Management program.

3.3 Measurement and Structural Models

As shown in Figure 1 we are measuring e-learners' knowledge acquisition traits and skills and the predictive variables associated with Blackboard Collaborate course content presentation, structure, readiness to use instructional technologies, and e-learners motivation.

3.3.1 Independent Variables

The literature suggests that surveys are valid and reliable tools to evaluate user's perception of web-based learning (Fan and Le, 2011). A survey was developed specifically for this study from Politis's (2003a) original items, which demonstrated acceptable reliability and factors loading structure of the subscales. The original items were rewritten and/or edited to capture students' perceptions on the Blackboard Collaborate course content presentation, structure, readiness to use instructional technologies, and students' motivation towards online learning. The authors reviewed the items carefully to eliminate confusing language and grammar through Politis's (2012) pilot study prior to continuing the process. The survey used in the study comprises 18 items shown in Appendix II. Each item was scaled from "definitely not true", 1 to "definitely true", 7. We conducted a FA using Varimax rotation of all items in order to check the independence of the constructs. As shown in Appendix III the FA clearly supported the independence of four constructs: Blackboard access and deliberate structure (six items, α = .83, AVE = .40), course content presentation (five items, α = .80, AVE = .33), readiness to use instructional technologies (three items, α = .65, AVE = .49), and online learning students' motivation (three items, α = .85, AVE = .72). Item 13 was dropped due to cross loading, and hence was not included in the structural path model.

3.3.2 Dependent Variables

The traits and skills of online students that are essential for knowledge acquisition were assessed by employing Mykytyn et al.'s (1994, p. 97) 26-item instrument, which was operationalised by Politis (2003b). The instrument measures six knowledge acquisition attributes namely: communication/ problem understanding, personal traits, control, organisation, negotiation, and liberal arts/nonverbal communication. Each item was scaled from "very unqualified", 1 to "very qualified", 7. We conducted a FA using Varimax rotation of all items in order to check the independence of the constructs. The FA findings supported the independence of six factors: communication/problem understanding (four items, α = .85, AVE = .51), personal traits (three items, α = .78, AVE = .44), control (three items, α = .72, AVE = .40), organisation (four items, α = .81, AVE = .49), negotiation (six items, α = .80, AVE = .44), and nonverbal communication/liberal arts knowledge (two items, α = .70, AVE = .53). Four items were dropped due to cross loading and hence were not included in the structural path model.

Given acceptable reliability and convergent validity of the measures, we reduced the number of observed variables by creating a composite scale of each of first order latent constructs using Politis's (2005; 2001b) approach. Means, standard deviations (SDs), AVE, alpha (α) coefficients, and intercorrelations between the examined variables are depicted in Table I.

Table I: Means, SDs, AVE, α, λ, θ estimates and Pearson's bivariate correlations of the synchronous Blackboard Collaborate online learning environment, e-learners motivation and knowledge acquisition attributes

Latent Construct	Mean[a]	AVE[c]	SD(σ)	λ[d]	θ[e]	1	2	3	4	5	6	7	8	9	10
Blackboard Collaborate Online Learning Environment Attributes and e-Learners Motivation															
Blackboard access and deliberate structure	5.21	0.40	1.11	1.01	.209	**.83**[b]									
Course content presentation	4.61	0.33	1.37	1.23	.375	.79**	**.80**								
Readiness to use instructional technologies	5.15	0.49	1.31	1.06	.601	.61**	.67**	**.65**							
Online learning learners' motivation	4.96	0.72	1.49	1.37	.333	.38**	.45**	.17	**.85**						
Knowledge Acquisition Traits and Skills															
Communication/ Problems Understanding	4.67	0.51	1.21	1.12	.220	.54**	.58**	.45**	.44**	**.85**					
Personal traits	5.23	0.44	1.13	1.00	.281	.38**	.40**	.24*	.37**	.53**	**.78**				
Control	4.63	0.40	1.28	1.09	.459	.29**	.39**	.28*	.46**	.51**	.49**	**.72**			
Organisation	5.09	0.49	1.06	0.95	.213	.30**	.35**	.31**	.35**	.34**	.56**	.73**	**.81**		
Negotiation	4.77	0.44	1.02	0.91	.208	.51**	.54**	.44**	.39**	.68**	.59**	.59**	.42**	**.80**	
Liberal arts knowledge/ nonverbal communication	4.08	0.53	1.54	1.29	.711	.46**	.60**	.47**	.37**	.80**	.59**	.47**	.42**	.65**	**0.70**

Notes: *Significant correlations at .05 level; ** Significant correlations at .01 level; [a] mean of N = 84; [b] coefficient alphas (αs) are located on the diagonal; [c] average variance extracted; regression coefficient, [d] $\lambda = \sigma * \sqrt{\alpha}$; has been rounded to two decimal places; [e] error variance, $\theta = \sigma^2 * 1 - \alpha$ (Munck, 1979).

3.3.3 Structural Model

Using Munck's (1979) equations we computed both the regression coefficients (λ_i) and the measurement error variances (θ_i) for each latent construct. The λ_i and θ_i of each latent construct (see Table I) were built in the path model in order to test the hypotheses (Politis, 2001a; 2001b). The hypothesised relationships between the first order latent constructs were tested using the structural model shown in Figure 2. Figure 2 shows the estimated path coefficients (γ values) of the best fit structural equations model. The analysis revealed that the model of Figure 2 was accepted as the best fitting model because it was found to satisfy fairly well the suggested threshold values of the most commonly reported fit indices; e.g., GFI = .90, AGFI = .73, CFI = .95, TLI = .89, NFI = .92 and IFI = .95. The χ^2 = 45.73, the df = 21 and χ^2/df = 2.17, with ρ = .001, and the RMR = .11 and RMSEA = .12. Worse fitting models were produced by adding, removing or reversing paths. The γ values are provided to facilitate the discussion of the regression coefficients.

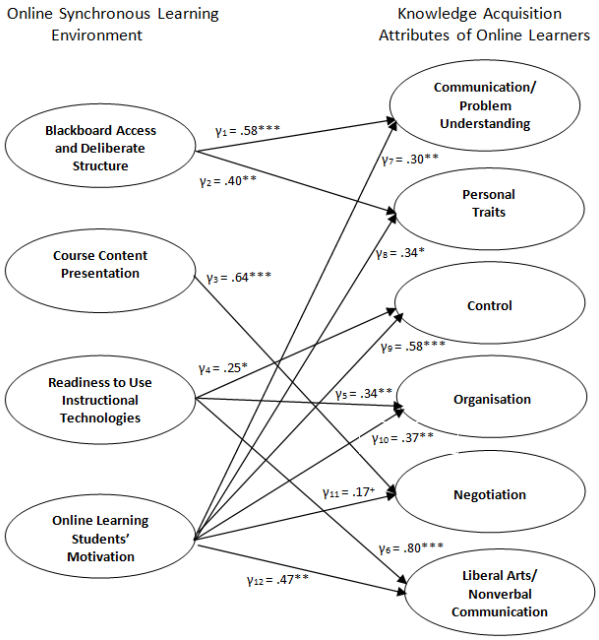

Figure 2: Structural estimates of the hypothesised model[a]

[α] Standardised path coefficient; N = 84; [+].1; *p < .05; ** p < .01; *** p < .001.
All correlations of exogenous variables were statistically significant @ .001 level.

3.3.4 Research Findings – Results

The means, standard deviations (SDs), AVEs, alpha coefficients and correlations of the examined constructs are reported in Table I. A number of observations are worth noting. First, the constructs display reliabilities greater than .70, which are considered acceptable (Hair et al., 2011). The construct of 'readiness to use instructional technologies', reported slightly lower alpha coefficient ($\alpha \geq .65$) indicating marginal reliability of the measurement scale. Second, five of the ten constructs display AVE higher than .49, suggesting a sufficient degree of convergent validity, meaning that these latent constructs "explained more than half of the indicators' variance" (Hair et al., 2011, p. 146). The other constructs explained more than 40 percent of the indicators' variance. Moreover, the Pearson's bivariate correlations clearly supported the four hypotheses. Finally, the patterns of correlations parallel those obtained from the structural modelling shown in Figure 2.

As shown in Figure 2 the four hypotheses are supported by the findings of the structural modelling for at least some dimensions of the online synchronous learning environment. As predicted, students' motivation towards online learning had a positive and significant effect on knowledge acquisition attributes of e-learners, supporting *H4*. Specifically, *online learning students' motivation* is positively and significantly related to communication/problem understanding ($\gamma_7 = .30$, $\rho < .01$), personal traits ($\gamma_8 = .34$, $\rho < .05$), control ($\gamma_9 = .58$, $\rho < .001$), organisation ($\gamma_{10} = .37$, $\rho < .01$), negotiation ($\gamma_{11} = .17$, $\rho < .1$), and liberal arts/nonverbal communication ($\gamma_{12} = .47$, $\rho < .01$). The expected positive influence of *readiness to use instructional communications technology* on the skills and traits of knowledge acquisition was supported by the data of this study for at least three knowledge acquisition attributes, hence partially supporting *H3*. Specifically, *the readiness to use instructional technologies* is positively and significantly related to control ($\gamma_4 = .25$, $\rho < .05$), organisation ($\gamma_5 = .34$, $\rho < .01$), and liberal arts/nonverbal communication ($\gamma_6 = .80$, $\rho < .001$).

As predicted by *H2*, there was one strong, significant and positive relationship between *course content presentation* and negotiation ($\gamma_3 = .64$, $\rho < .001$). The relationships between the other five knowledge acquisition attributes and course content presentation on Blackboard Collaborate were not supported by the structural model findings. Pearson's correlations however supported these relationships. Similarly, the effect of *Blackboard access and deliberate structure* on communication/ problem understanding and personal traits was strong, positive and significant ($\gamma_1 = .58$, $\rho < .001$; $\gamma_2 = .40$, $\rho < .01$, respectively). Hence, *H1* was partially supported by the data of this study.

4 Discussion

This paper examined the relationship between a specific online synchronous learning environment (e.g., course content presentation and structure supported by Blackboard Collaborate, the readiness to use instructional technologies, and the students' e-learning motivation) and the skills and traits of learners that are required for knowledge acquisition. The findings suggest that online learners found easily the course material on Blackboard Collaborate because the mean value of the *Blackboard access and deliberate structure* is equal to $\mu = 5.21$, $SD = 1.11$. Moreover, the findings suggest that the layout and structure designed on Blackboard Collaborate and operationalised through the screenshots shown in Appendix I assisted online learners to enhance their communication and problem understanding skills ($\gamma_1 = .58$, $\rho < .001$), and personal traits ($\gamma_2 = .40$, $\rho < .01$). However, communication and problem understanding and personal traits are acknowledged as essential factors of knowledge acquisition (Mykytyn et al., 1994). Hence, it is implied in this result that easily accessed and well-structured online learning environment may enhance the quality of students learning and the online university experience, an argument supported by Yamagata-Lynch (2014). The finding also suggests that online instructors should design structures which include, but are not limited to, a main posting area for each session as shown in Appendix I, Figure 3. The specific Blackboard Collaborate study area motivated learners to become more engaged in their learning process leading to improved knowledge acquisition attributes of personal traits and communication and problem understanding. In relation to the *Blackboard access and deliberate* structure used by the e-learners a few points are noteworthy. First, the Blackboard Collaborate classroom was open 24/7 throughout the semesters. Second, the recorded sessions through Figure 4 of Appendix I, were available 24/7 throughout each semester.

The current study seems to highlight that there is a certain skill which is enhanced by the course content as it is currently exhibited on Blackboard Collaborate. The results of this study suggest that the *course content presentation* employed on Blackboard Collaborate (Appendix I, Figure 3 and 4) strongly influences the e-learners skill of negotiation ($\gamma_3 = .64$, $\rho < .001$). A closer examination of this relationship suggests that the

course content presentation and the interaction of online students with content, peers and the instructor (Appendix I, Figure 5 – 7) develops the negotiating skills of 'diplomacy', 'patience', 'cooperation', sensitivity', and 'hindsight', which are required for e-learners knowledge acquisition. In that regard the Blackboard Collaborate technology is the enabler and not the catalyst for creating and enhancing the essential negotiating skills for knowledge requisition. As Kuh et al. (2006) concluded it is the instructor who creates an ICT challenging learning environment and facilitates collaborative and active learning. Therefore, it is the prior experience of the instructor using an online synchronous learning environment to substitute the face-to-face instruction received by the online learners.

In relation to the *course content presentation* on Blackboard a few points are noteworthy. First, the presented lessons via Blackboard Collaborate were well prepared and presented enthusiastically by the instructor. Second, the course content was progressively made available each week, and there was ample commitment to support collaboration and online learning interaction through announcements, course messages and online classroom presentations. Third, quizzes were designed for each synchronous session (see Appendix I, Figures 6 and 7) to engage students in an online discussions and debates in order to increase their interaction with the instructor and peers. Finally, the presentation of content exhibited on Blackboard was consistent throughout the data collection period. Some of these online practices have been well documented in the literature by Wdowik (2014), Mearns et al. (2007), and Kuh et al. (2006).

Furthermore, the findings of the present study supported previous arguments (Yamagata-Lynch 2014; Lishon-Savarino, 2013; Holley, 2002) in that the connectedness, readiness and interaction among peer-to-peer and learner-instructor enhanced the "development of critical thinking skills, co-creation of knowledge and meaning, reflection and transformative learning" (Brindley et al., 2009, p. 1). Specifically, it was found that having access to reliable Internet with at least an Asymmetric Digital Subscriber (ADSL) connection and effectively using the communication e-technologies provided learners' suitable online collaboration and interaction. This in turn enhanced the development of knowledge acquisition attributes of control, organisation and liberal arts/nonverbal communication. Moreover, there is a strong and significant relationship between readiness to use instructional technology and liberal arts/nonverbal communication (γ_6 = .80, ρ < .001). It is implied in this result that those who are trained in an interactive real-time computer assisted learning environment (Wdowik, 2014) are well-informed with liberal arts knowledge and are equipped with nonverbal communication skills.

A few points are noteworthy on the relation between *readiness to use instructional technologies* and knowledge acquisition attributes. The online learners that participated in the study had access to reliable Internet with at least an ADSL connection. Second, were equipped with microphones, USB headsets and laptops configured to properly operate Blackboard Collaborate. Third, 61.9% of the online students received training from the Institution on how to navigate through Blackboard Collaborate, and all had to adjust to learn in an online environment. Finally, the student-faculty evaluations consistently indicated students' satisfaction with the employed interactive online technologies, an argument supported by Li and Pitts (2009).

Moreover, the significant and positive relationship between *online learning students' motivation* and the five knowledge acquisition attributes suggests that it is the students' attested motivation to embark on synchronous online classes. Through this motivation e-learners developed the skills and traits of problem understanding, liberal arts/nonverbal communication, control, organisation, negotiation and personal traits. Learners' engagement with Blackboard Collaborate may be perceived challenging, enjoyable or even futuristic in a way that it enhanced intrinsic motivation and hence their engagement in synchronous online classes. Although intrinsic motivation was not properly measured in this study, it may be possible the correlations between e-learners motivation and the five knowledge acquisition attributes are attributed to "intrinsic motivation to know and to accomplish" (Giesbers et al., 2014, p. 38). This argument could present an interesting avenue for future research.

A few observations are noteworthy in relation to the *online learning students' motivation* towards Blackboard Collaborate learning. First, learners were motivated to participate on virtual learning because they were full-time employed and it was logistically easier to connect to synchronous online classes from home or their work environment. Second, students-faculty evaluations showed that the e-technology employed in the courses (Blackboard Collaborate) was the source of motivation of collaborative learning. Third, the commitment, motivation and online experience of the instructor were key ingredients of the quality of online instruction, an

argument supported by Deubel (2003). Fourth, the instructor exhibited sensitivity to students' problems and encouraged them to express their opinion during the synchronous online classes, an argument supported by Mearns et al. (2007). In fact students were frequently invited to engage in synchronous online debates on selected topics of the lesson.

Concluding, the findings of the study clarify which of the online synchronous Blackboard Collaborate learning characteristics best predict the skills and traits of knowledge acquisition. In particular, learners who are proficient with educational communication e-technologies are well-informed with liberal arts knowledge compared to those who are not prepared and motivated to use information and communications technology. In addition, easy access to Blackboard Collaborate and deliberate structure found to motivate learners become more engaged in their learning process leading to improved knowledge acquisition attributes of conceptualisation, tolerance and amiability (e.g. personal traits). Furthermore, the Blackboard Collaborate structure, shown in Appendix I, promotes learners problem understanding and communication. Finally, e-learners' motivation towards online learning is a key ingredient to enhance their skills and traits of knowledge acquisition.

4.1 Limitations and Future Research

The current study has a number of limitations. First, the study was conducted at a HE Institution in the UAE, hence the generalisability of the findings cannot be assumed. The lack of generalisability coupled with the small sample size render the research findings to be sample bias. Future research should replicate the study using data from different campuses to validate the causal relationships of the examined variables. Second, the cross-sectional nature of the study leaves the current study susceptible to the common methods variance (CMV) (Podsakoff et al., 2003). However, according to Chang et al. (2010, p. 182) "if the research probes into difficult waters where data of any kind are scarce such as in severely understudied parts of the world (Africa, the Middle East) ..... it should not be rejected...solely on the grounds of common methods". Since the study was carried out in the Middle East it should not require remedies for the CMV. Moreover, more confidence could be placed on the findings by replicating the current study (Craighead et al., 2011). Third, the usage of the relatively underdeveloped scales measuring the dimensions of the online synchronous learning environment supported by the Blackboard Collaborate needs to be further validated by using experimental studies.

The variables of the synchronous online learning environment were considered important in this study in capturing the structure, content presentation and readiness to use instructional technologies. However, future research must examine the intrinsic motivation, commitment and satisfaction of the online learners in the context of knowledge acquisition. Moreover, future research should measure the variables of autonomous motivation and engagement in synchronous communication in the context of knowledge acquisition. Finally, different layouts and structured virtual classrooms should be introduced by researchers to further investigate the strength of relationships between the examined variables. An alternative Blackboard layout and structure are presented in the following section aiming at encouraging future researchers to investigate the relationship between knowledge acquisition skills and traits of online learners and an online synchronous learning environment.

5 Reflection on an Online Synchronous Blackboard Collaborate Learning Environment

Although the findings of the study suggest that easy access, layout and structure of Blackboard Collaborate enhanced learners' communication, problem understanding skills and personal traits, the employed layout and structure was not related to control, organisation, negotiation and liberal arts/nonverbal communication. Reflecting on the layout and structure shown in Figure 3 of Appendix I, it is acknowledged that the employed layout does not provide online learners immediate and direct access to a variety of course resources. In that regard we propose a more innovative and thoughtful layout and structure, which should have the appearance displayed in Appendix IV, Figure 1. As shown on the left hand side, the proposed layout provides direct access to: Course Information, Teaching Material, Course Assessments, Discussion Board, an Online Classroom, Student Resources such as Blackboard Collaborate class information and study skills online, and Research Resources such as e-library resources, Course email, and Announcements. Moreover, we suggest providing online learners with guidelines on how to access and operationalise the variety of the features and resources offered via Blackboard Collaborate. In addition, it is also important to promote peer-to-peer, and student-to-

faculty synchronous interaction and online university experience during the first week of the semester, practices advocated by Mearns et al. (2007).

In relation to the content presentation on Blackboard we suggest making the entire course content available and accessible from the first week, in order for online students to plan their workload. Therefore, we propose the presentation of course content to have the appearance displayed in Appendix IV, Figure 2. Online revision question and tutorial tasks should be also included for each lesson, as shown in Figure 2 of Appendix IV, followed by the discussion board debates, blogs and online challenging quizzes.

Although the findings of the study suggest the connectedness and readiness to use instructional technologies were positively related with knowledge acquisition attributes of control, organisation and liberal arts/nonverbal communication, we feel that employing additional online interactive tools might enhance learners' motivation and determination towards online learning. In that regard we propose to assist learners outside the synchronous Blackboard Collaborate online environment with blogs, emails, RSS feed (Rich Site Summary), Skype, voice podcasts and wikis (see Appendix IV, Figure 3). In addition, we recommend preparing a handbook titled 'Experience the Power of Collaboration', and distribute it to online learners a few weeks ahead of the semester. The objective is to enhance learners' the communications technology skills. Moreover, each Power Point slide should be simple to avoid cramming, as shown in Appendix IV, Figure 4. In addition, it is envisaged to present one slide per two minutes during the synchronous online class. The class size should be $12 \leq$ class size ≤ 18 in order to engage learners in active and effective online synchronous class debates and discussions. Finally, we found e-learners need support on how to break down assignment requirements and start researching. Therefore, we suggest creating YouTube videos to assist online learners deciphering the requirements of the assignments. A typical YouTube video can be found at: http://youtu.be/wuqN3MJrSrs.

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Appendix I

The screenshots from Blackboard Collaborate shown below depict the course layout and structure which was employed for the online synchronous delivery of the various courses offered throughout the period of February 2013 to June 2015.

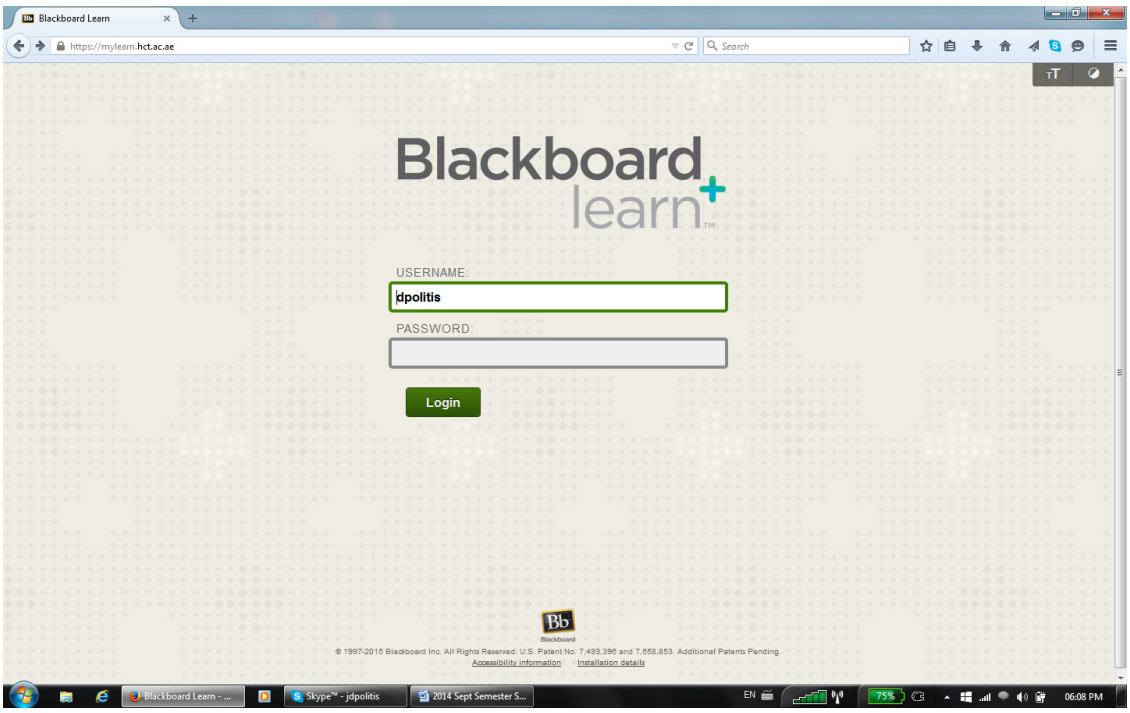

Figure 1: Login Window

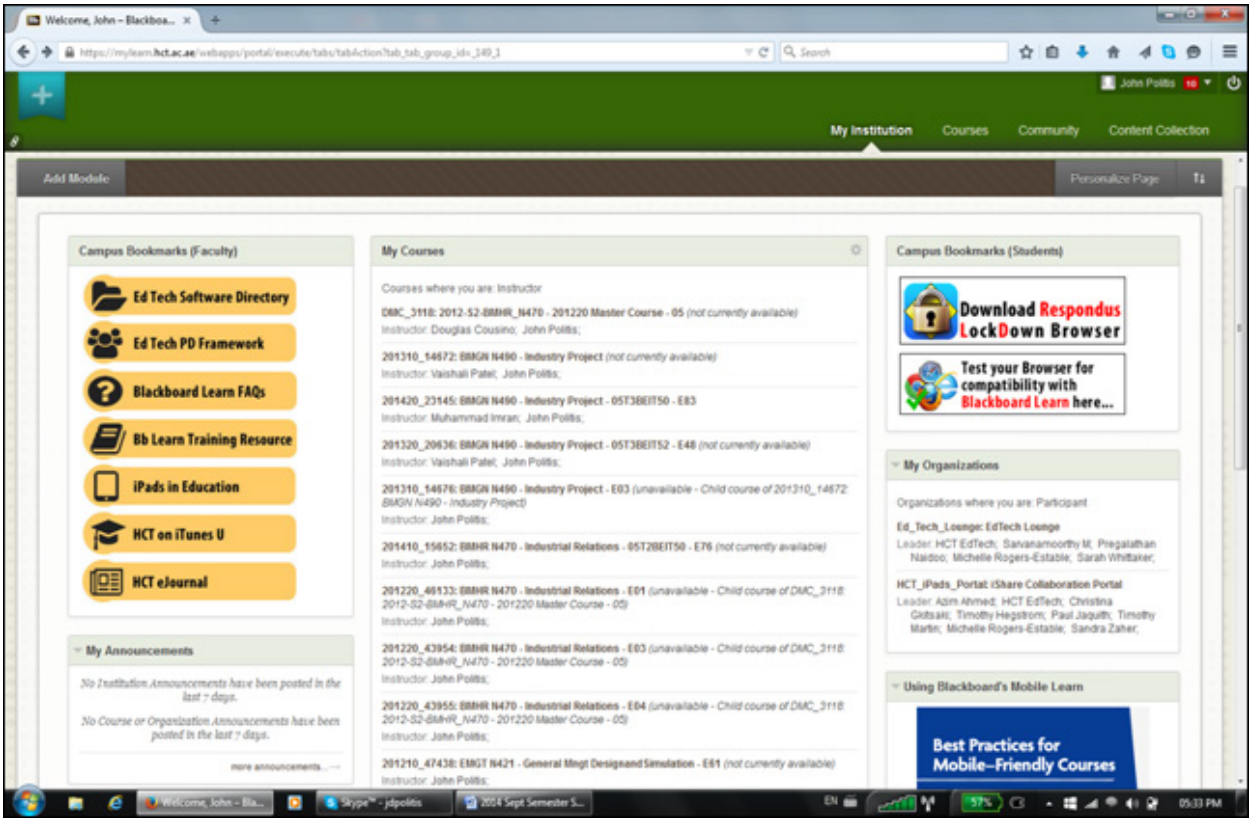

Figure 2: Launch-Open the Enrolled Course

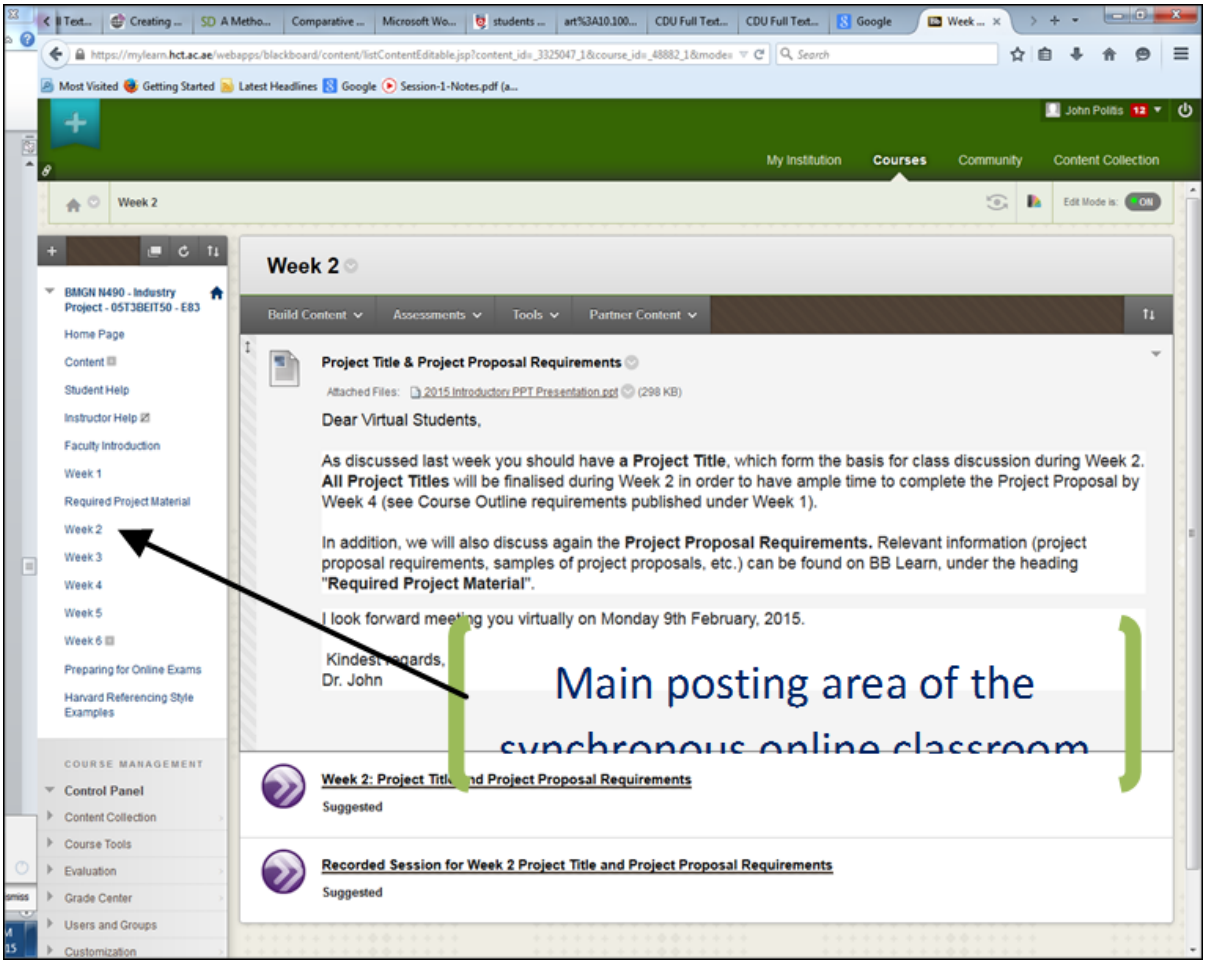

Figure 3: Posting Area of the Online Classroom

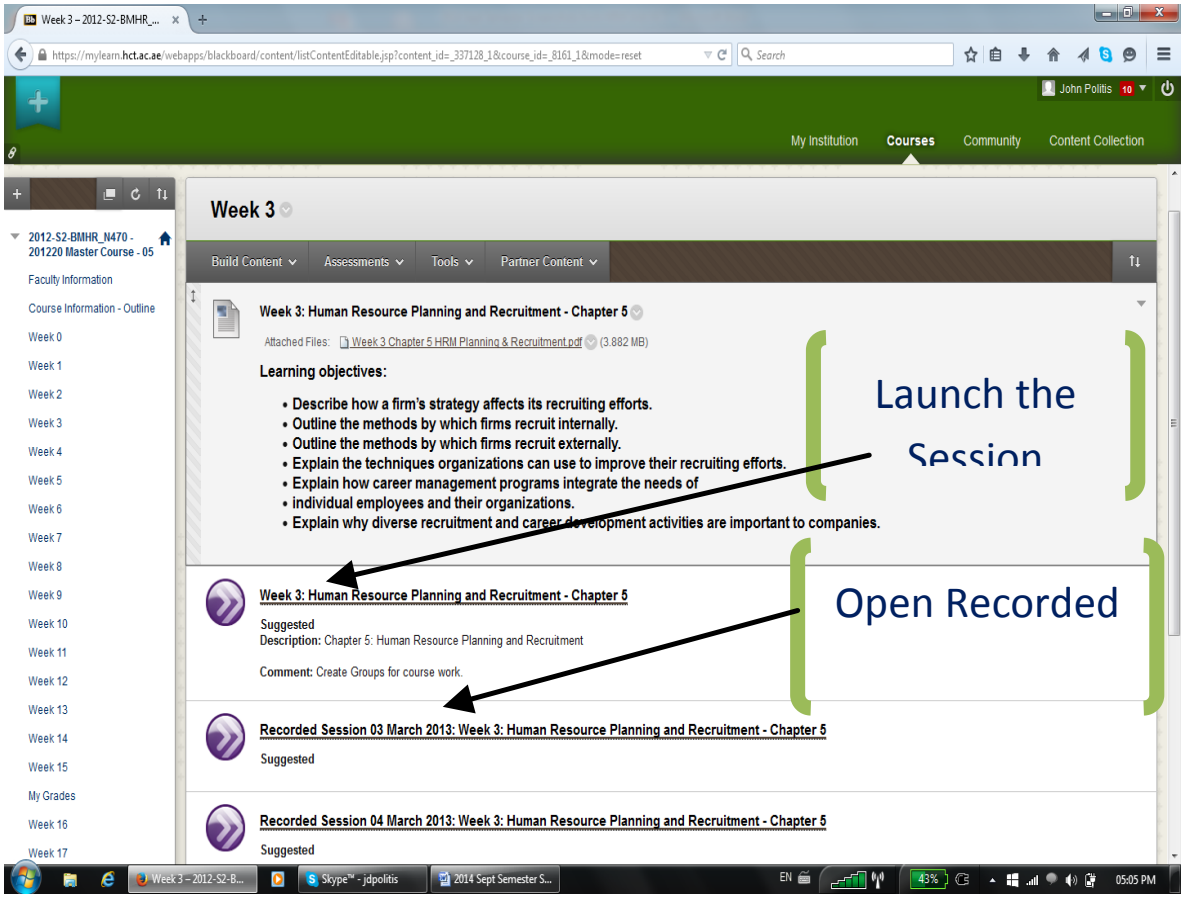

Figure 4: Launch the Session and Recorded Sessions

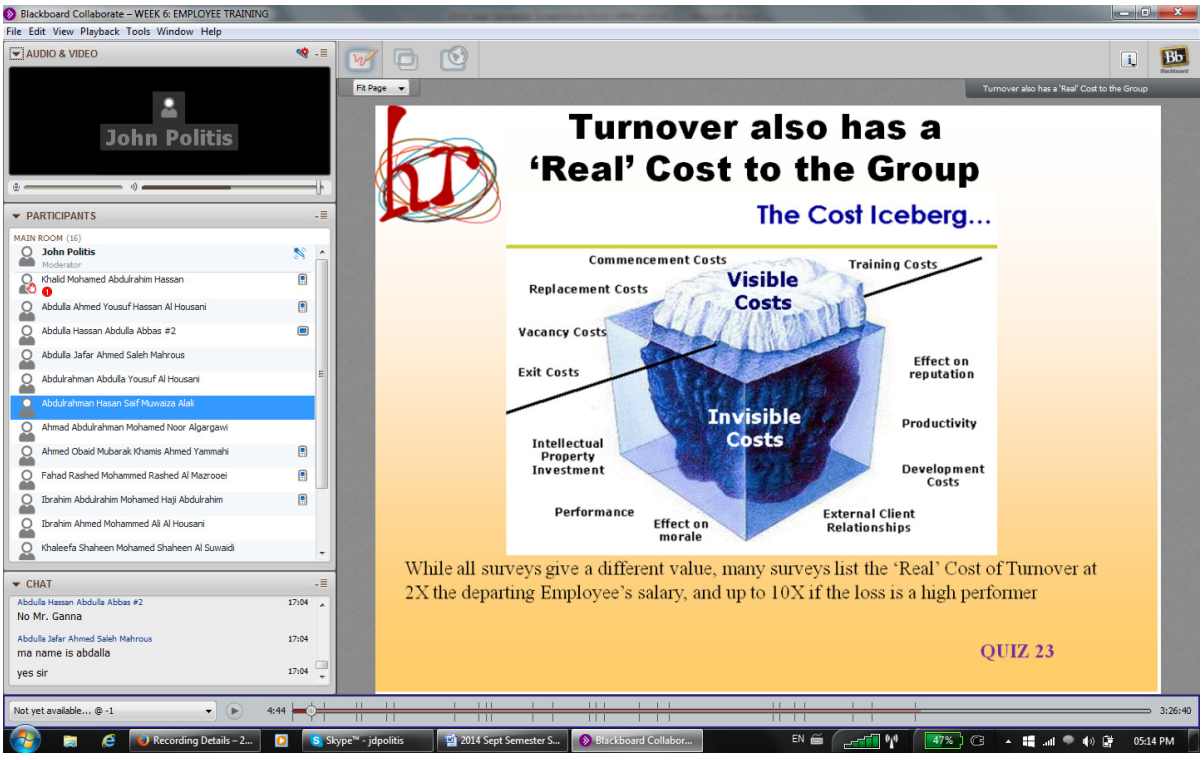

Figure 5: Typical Online PPT Presentation

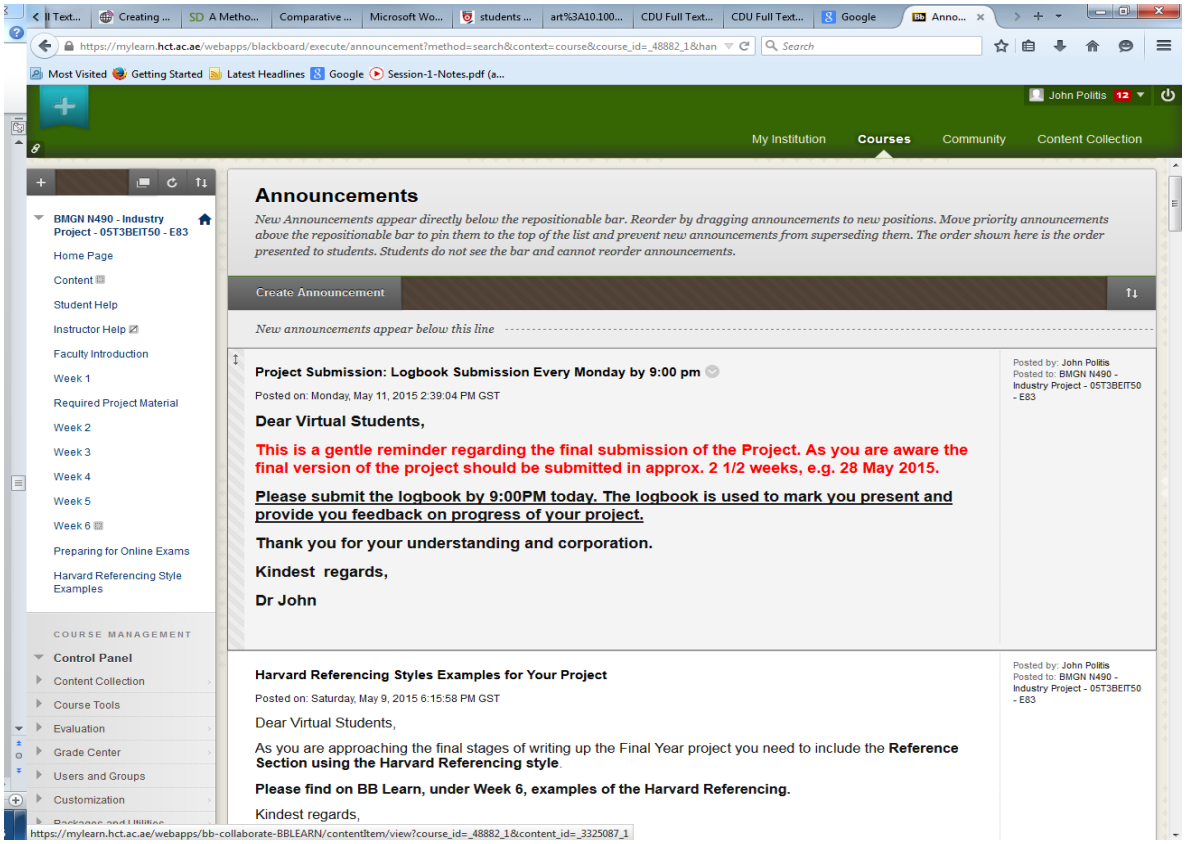

Figure: 6 Typical Synchronous Online Quiz

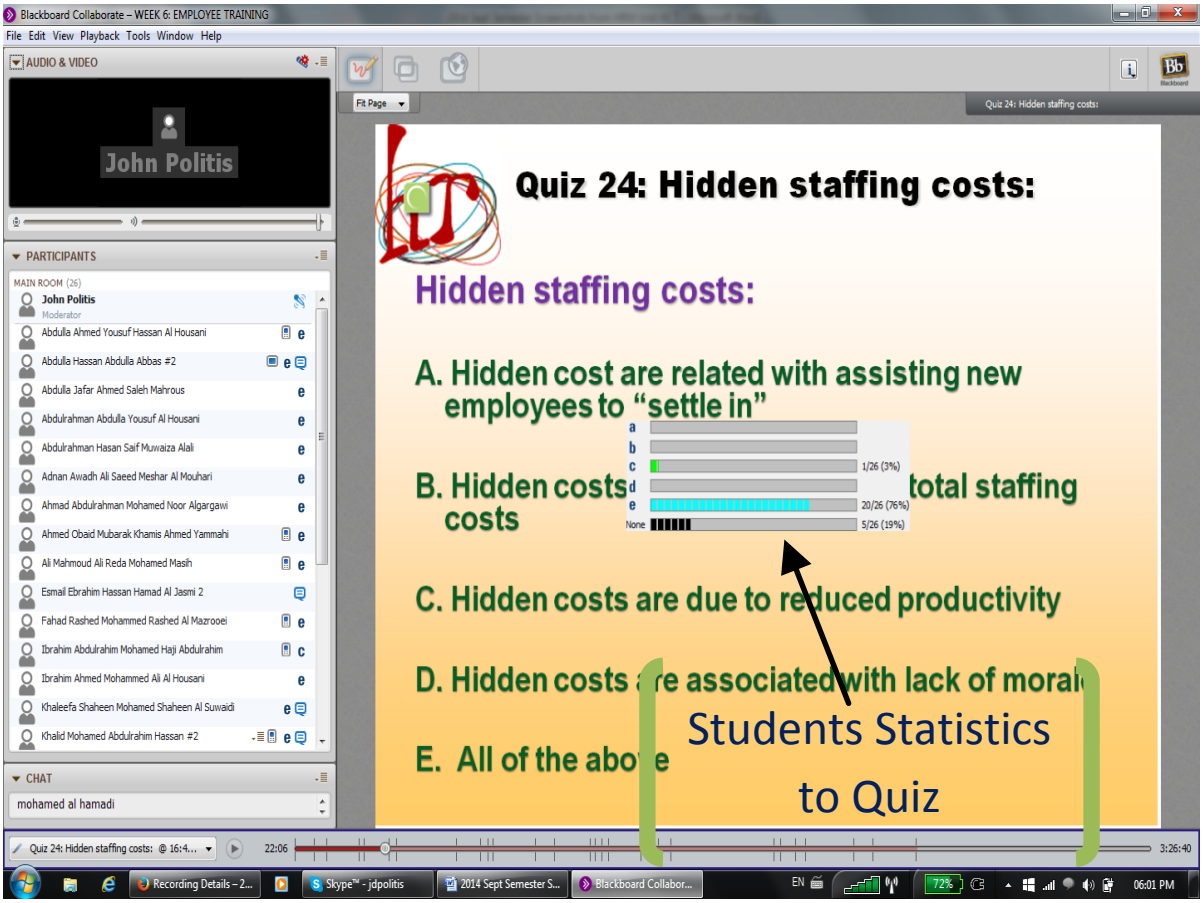

Figure 7: Learners' Statistics to Quiz

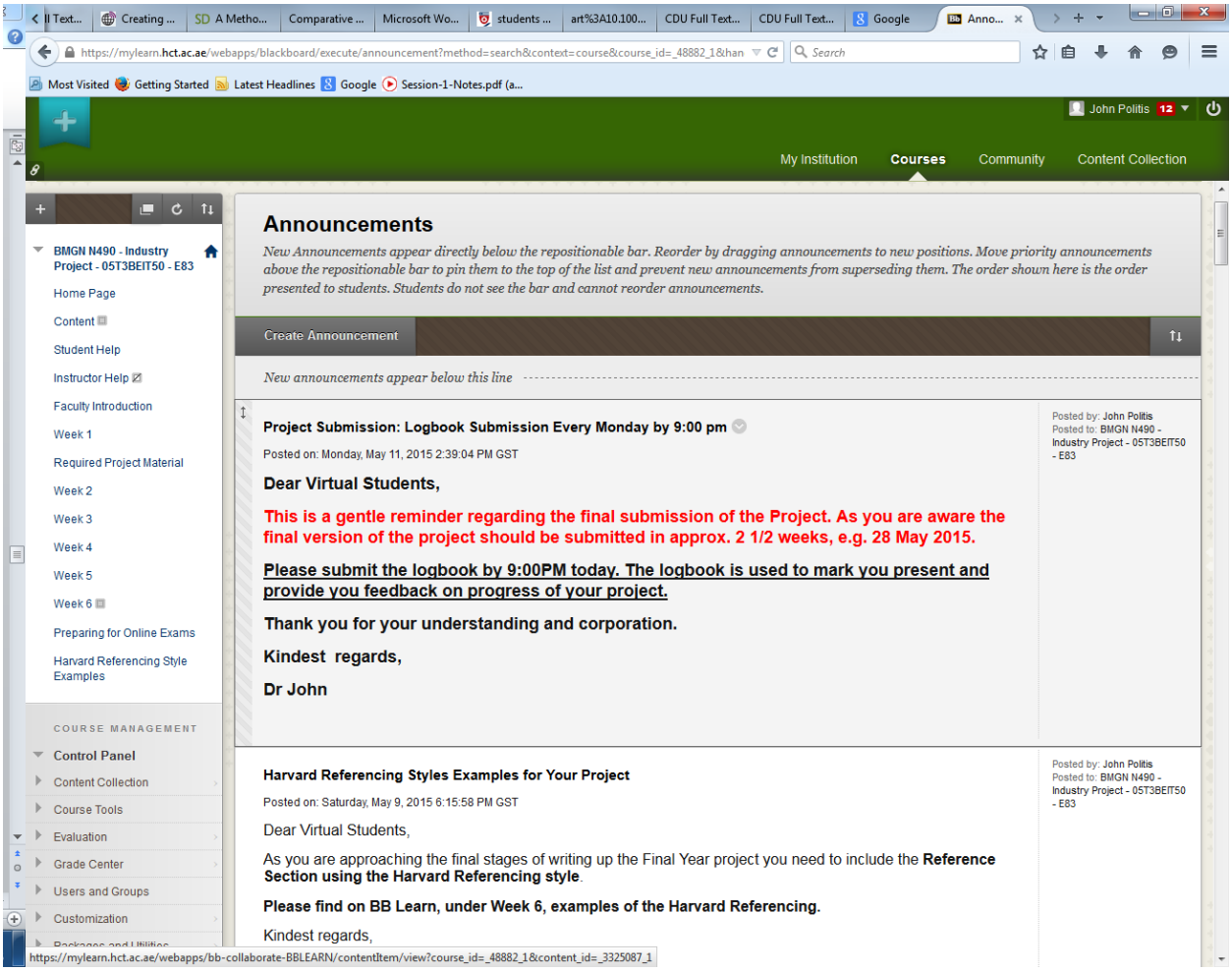

Figure 8: Typical Online Announcement Option

Appendix II

Items used to measure the online synchronous learning environment.

I. Blackboard Collaborate access and deliberate structure

2. It was easy to find the educational material on Blackboard Collaborate.
3. The Blackboard Collaborate was well organised and clear to understand
4. On Blackboard Collaborate I found what I was looking for quickly and easily.
5. The Blackboard Collaborate pages and images were quick to download.
11. I liked using the Blackboard Collaborate for my learning.
12. The Blackboard Collaborate has encouraged me to visit it again and again.

II. Course content presentation

7. The content on Blackboard Collaborate was easy to read.
10. The information on Blackboard Collaborate was useful.
8. The Blackboard Collaborate links were easy to find and read.
6. The Blackboard Collaborate pages and sections were clearly laid out.
9. There is too much information on Blackboard Collaborate.

III. Readiness to use instructional technologies

15. I have access to reliable Internet connection with an Asymmetric Digital Subscriber (ADSL).
14. I enjoy spending time browsing the Blackboard Collaborate.
13. I use a computer on a regular basis for educational purposes.
1. I am comfortable using information and communication technologies.

IV. Online learning students' motivation

16. I do enjoy trying new things such as the Internet.
17. I am a self-started and motivated to study online.
18. I have a desire to obtain online skills for future job opportunities.

Appendix III

Table 1: Factor loadings of Blackboard Collaborate leaning environment

	Factor Loading			
Item	1	2	3	4
Blackboard Collaborate access and deliberate structure				
3. The Blackboard Collaborate was well organised and clear to understand	0.81			
5. The Blackboard Collaborate pages and images were quick to download	0.80			
11. I liked using the Blackboard Collaborate for my learning	0.63			
2. It was easy to find the educational material on Blackboard Collaborate	0.49			
12. The Blackboard Collaborate has encouraged me to visit it again and again	0.46			
4. On Blackboard Collaborate I found what I was looking for quickly and easily	0.35			
Course content presentation				
8. The Blackboard Collaborate links were easy to find and read		0.73		
10. The information on Blackboard Collaborate Was useful		0.63		
6. The Blackboard Collaborate pages and sections were clearly laid out		0.58		
7. The content on Blackboard Collaborate was easy to read		0.45		
9. There is too much information on Blackboard Collaborate		0.40		
Readiness to use instructional technologies				
14. I enjoy spending time browsing the Blackboard Collaborate			0.84	
1. I am comfortable using information and communication technologies			0.62	
15. I have access to reliable Internet connection with an Asymmetric Digital Subscriber (ADSL)			0.62	
13. I use a computer on a regular basis for educational purposes	0.25		0.01	0.10
Online learning students' motivation				
17. I am a self-started and motivated to study online				0.87
16. I do enjoy trying new things such as the Internet				0.85
18. I have a desire to obtain online skills for future job opportunities				0.82

Factor: 1 = Blackboard Collaborate access and deliberate structure; 2 = Course content presentation; 3 = Readiness to use instructional technologies; 4 = Online learning students' motivation.

Appendix IV

Blackboard Collaborate suggested course layout and structure for a synchronous online learning.

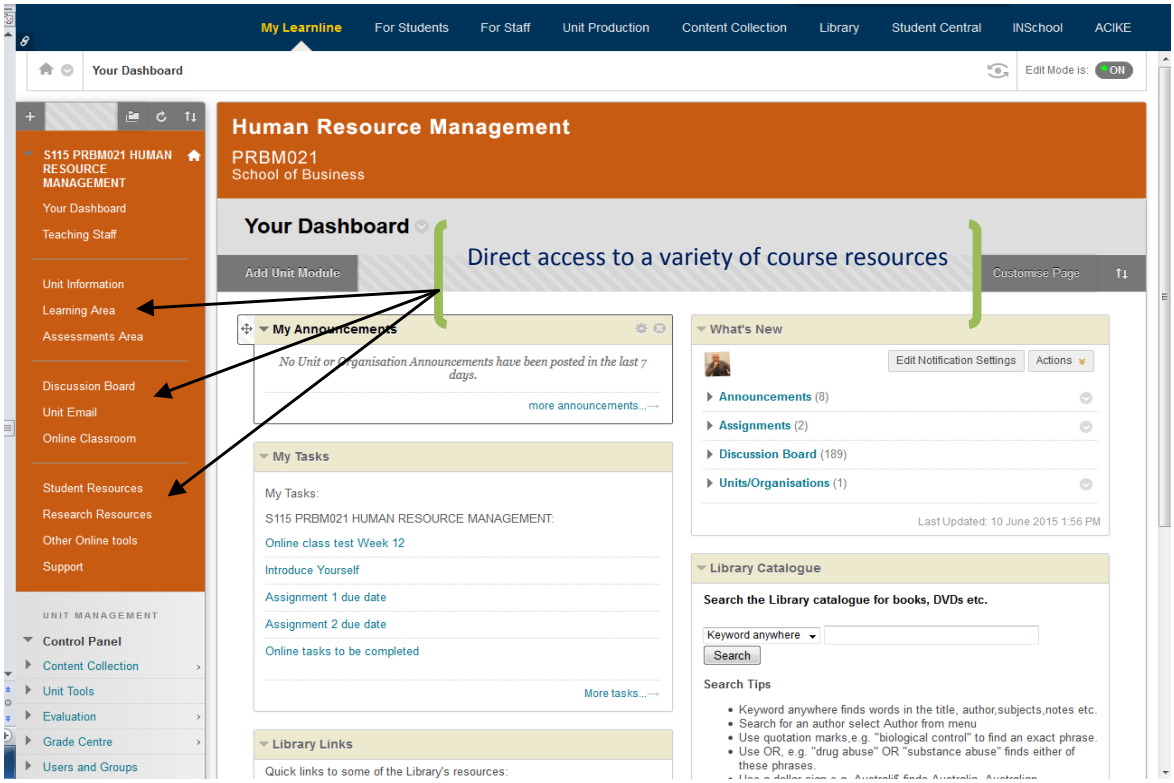

Figure 1: Layout and Structure Offering Direct Access to a Variety of Course Resources

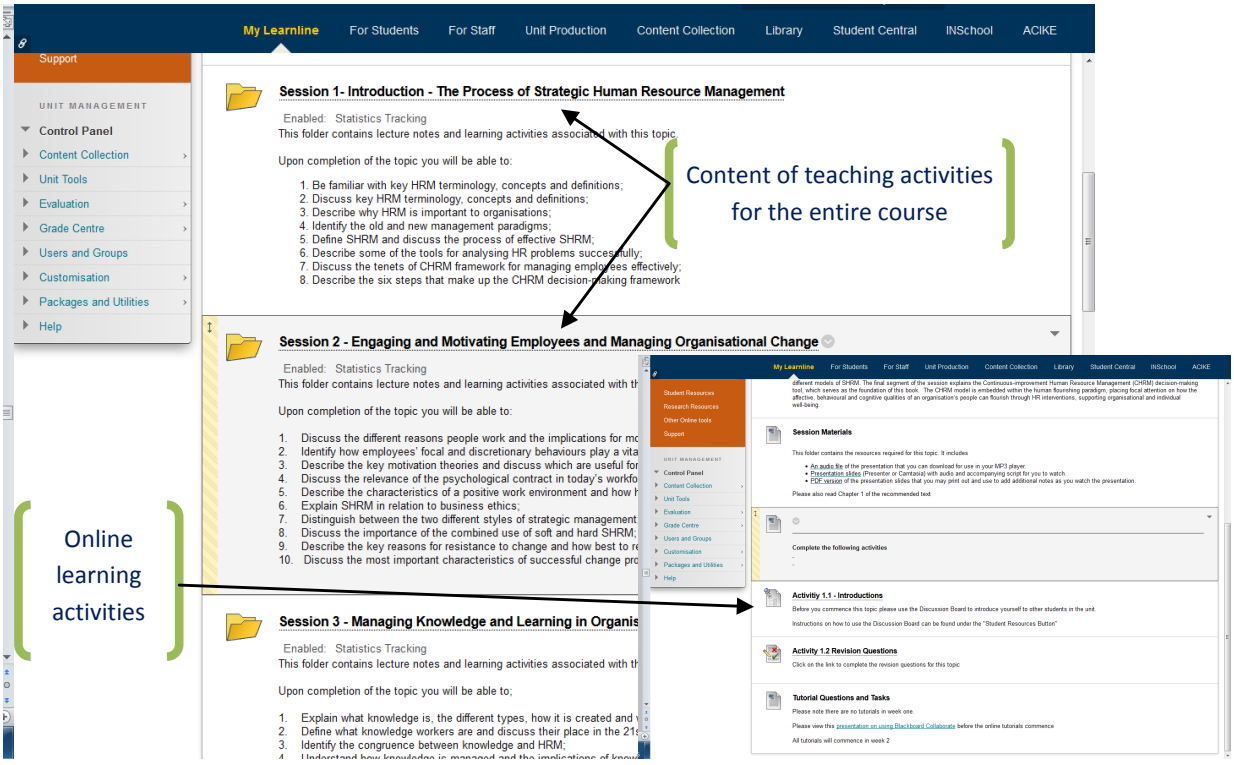

Figure 2: Course Content Presentation and Online Learning Activities

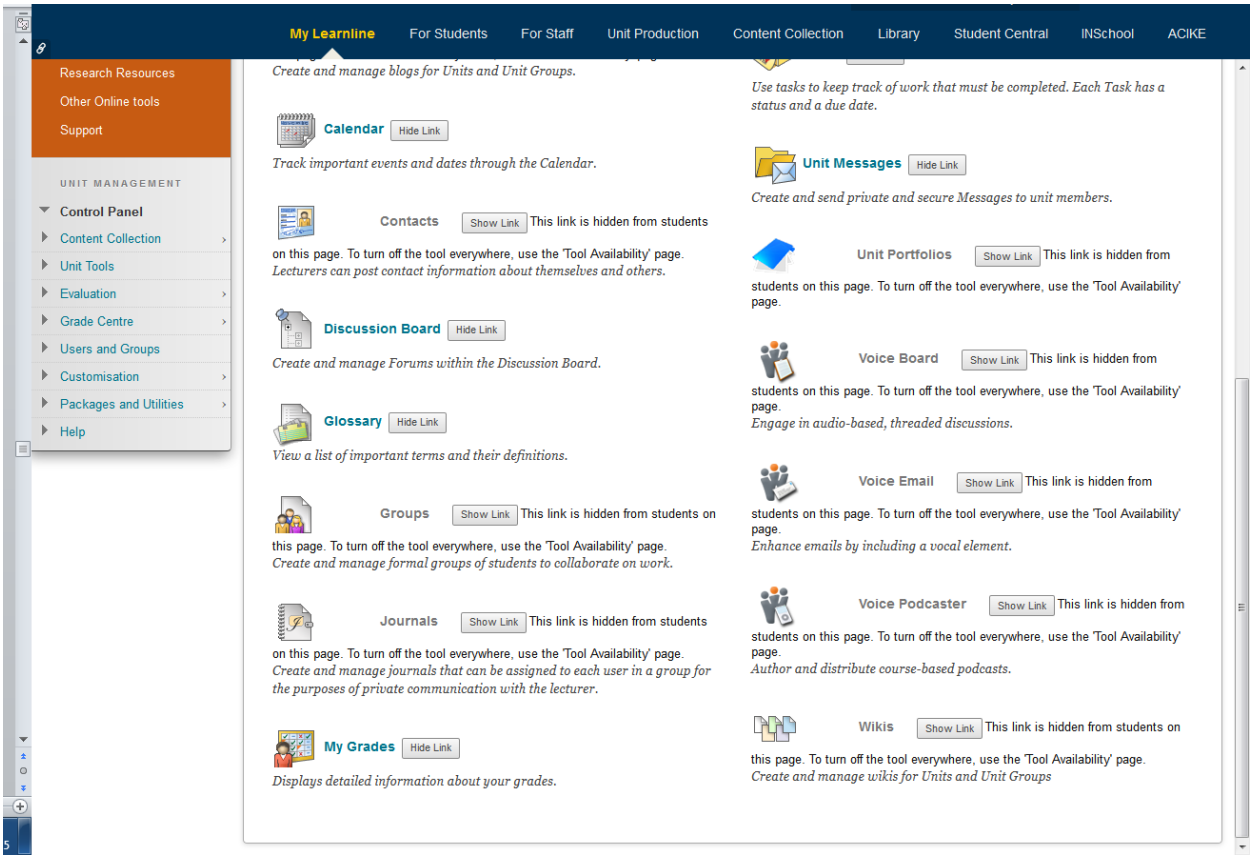

Figure 3: Additional Interactive Online Tools

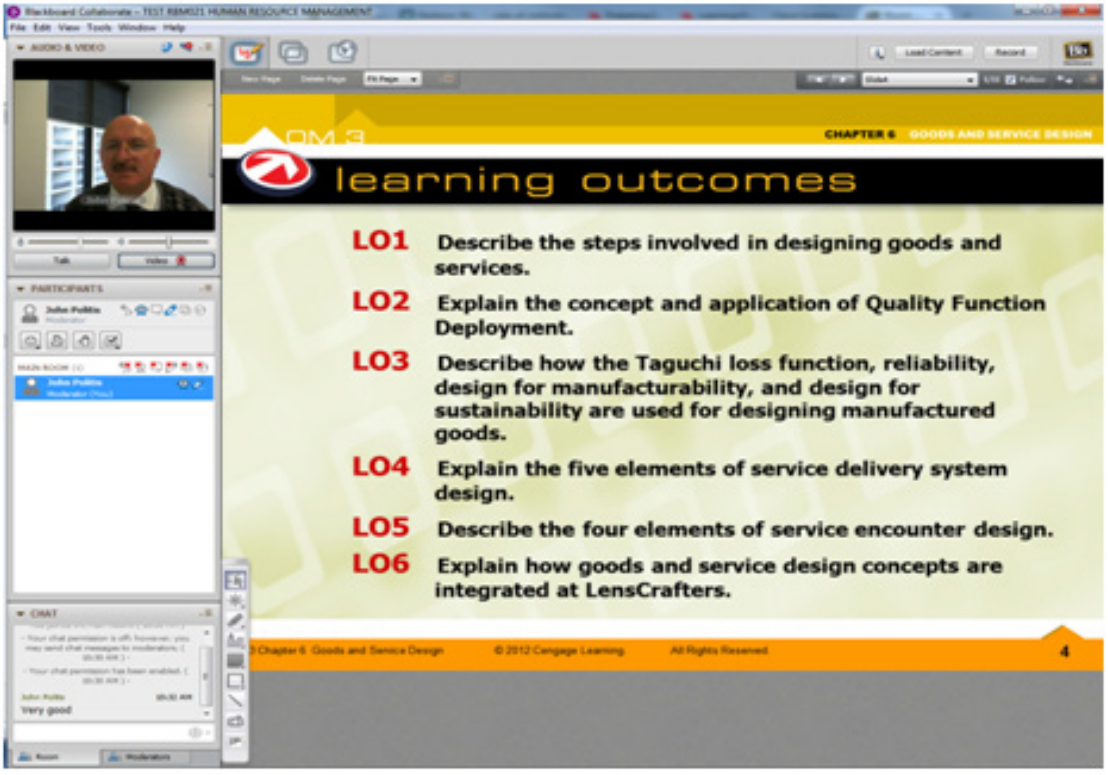

Figure 4: Avoid Cramming on the Power Point Presentations