COMMUNICATION MANAGEMENT IN DISTANCE LEARNING SCALE VALIDATION

Bakare kazeem Kayode (PhD)

ABSTRACT

The aim of this study is to investigate the relationship between communication management indicators namely communication practices, communication tools and learners' cognitive engagement in distance learning programme. A set of hypotheses concerning correlational links between constructs are derived from the literature. This study was conducted using quantitative approach. Questionnaire was used to elicit responses from 405 randomly selected distance learners from three Malaysia Public universities offering distance-learning programmes. Data analysis was conducted using Analysis of Moment Structures (AMOS) version 18 software to test the relationship between communication practices, communication tools and learners' cognitive engagement. Confirmatory Factor Analysis (CFA) was conducted to establish the validity and reliability of the items. Tests of hypotheses provided evidence of measures of fit and statistical significance of the measurement model. The findings provide evidences of model fit and that effective communication practices and communication tools have strong positive relationship with students' cognitive engagement. The study establishes the relevance of communication management in enhancing self-directed, self-motivated and self-dependent distance learners.

Keywords: **Communication Management, Distance Learning, Scale Validation, Communication Tools.**

Corresponding Author:
Faculty of Education,
Al-Madinah International University,
MALAYSIA.

Email: kosimbakr@gmail.com

INTRODUCTION

Separation between learners and instructors in distance learning programme require special patterns of learner and teacher behaviours (Moore & Kearsley 2005). This separation leads to a communication space to be crossed. Consequently, potential misunderstanding usually ensues between the inputs of instructor and that of the learner. To cross this communication space, there is need for a concerted effort to develop measures that will enable programmes and process owners in distance education to manage the mismatch between instructors and learners. There have been efforts to develop measures for distance learning communication and learning from authors such as Kaur (2006) and Dzakiria (2012). However, these measures only look into the use of technological variables to enhance teaching online. Variables that measure coordination of technological use, effective teaching and learning, interaction and engagement of distance learners as maintain by Moore and Kearsley (2005), has yet to be developed. Literature suggest that effective management of communication between distance learners and instructors facilitate engagement in learning. Communication management involves communication practices and communication tools. Communication practices relate to teachers' presentation skills, technical competencies, virtual management techniques, and the ability to engage students through virtual communication, organizing course material, timely response, clarity of content and feedback (Moore & Kearsley, 2005; Partlow & Gibbs 2003). Communication tools are different types of computer/internet-based technology that are used by the distance-learning instructors to communicate and teach the students (learner-interface). They include Learning Management System (LMS), Web CT, emails, Facebook and threaded discussion forum (Khan, 2005). Of recent is the emergent of new learning platforms such as Massive Open Online Courses (MOOCs), Webinar, Moodle, WiZiq etc. All these are components of communication tools in the context of this study.

Student cognitive engagement describes students' feedback, students' representation and students' participation in learning. It also includes feelings and sense making or involving in learning activity. It depicts the cognitive engagement and compliance of student with cognitive activities norms, such as active participation in online forum discussion attendance and involvement in-group work, completion and submission of assignment (Trowler, 2010).

The classroom (conventional) method of teaching and learning which involves the physical presence of teachers and students does not cover the need of learners that are constrained by time and space (Khan, 2005). Therefore, rather than meeting in a conventional classroom, teachers and students in distance learning communicate synchronously via online communication. In synchronous communication, students and lecturers interact at different locations. At the same time, video conferencing, group chat or webinar are also used. With this development, many universities and colleges have included distance education programmes as part of their educational services. Distance education programmes require a systematic management of communication process (Dabaj, 2011). This include processes such as planning, curriculum design, instructional design, evaluation and implementation of policy that can foster and support active learning in distance education environment (Khan, 2005; Moore & Kearsely, 2012). Higher institutions need to embrace communication management techniques in response to the rapid expansion of distance education opportunities. These opportunities can be utilized by adopting and integrating the composite function of communication management sub-constructs of communication practices, communication tools and students' cognitive engagement to facilitate teaching and learning (Beaty, 2004; Peggy, 2014).

The instructional support from instructors in distance education programme had historically been undervalued. This misunderstanding is because of the myth surrounding the notion of management of many education institutions that teaching and learning in distance education is not different from the conventional. Mei, Su, Ahmad and Rosnaini (2017) asserted, "Instructors' pedagogical conceptions and values often do not include using ICT as part of their teaching and learning process" (p. 23). Similarly, Kuleshov (2008) commented that if the pursuit of open distance learning is not supported by require faculties, technical support staff, instructors' knowledge and students, it will be counterproductive.

That is, instead of improving teaching and learning process, it will lead to it degradation. In addition, findings from the study of Motaghian, Hassanzadeh, and Moghadam (2013) showed that factors such as monetary, instructors' pedagogical and technical competencies affect the success of distance learning initiative. Mei, Su, Ahmad & Rosnaini (2017) stated, "School leadership is often unable to provide strong leadership and strong support due to their own lack of technological knowledge and experience" (p. 28). Mei, Su, Ahmad and Rosnaini (2017) also pointed out that lack of understanding of distance learning environment (embedding technology into pedagogy for effective teaching) leads to poor instructional support of instructors. Therefore, the pedagogical aspect of the course material presented in distance learning programme should do away with traditional ways of teaching (Sa'adon, Dahlan, & Zainal, 2013; Rajasegeran, 2012). This occurs especially in institutions that are not fully into distance education settings per se. In this kind of settings, the prevalence perception is that instructor's role is mainly to grade or mark students' assignments that are completed at appointed time (Lentell, 2003). As the need for quality materials that can improve learners' engagement in distance education increases, the emphasis and demand for the need of self-regulated learners becomes necessary.

The recruitment of less experienced instructors in teaching and learning at a distance in most institutions poses challenge of inability to transmit necessary instructional supports for learners in distance learning programme (Khan, 2005; Moore & Kearsley, 2005). The norm is that distance-learning (DL) instructors do make a difference in student engagement. Nevertheless, the extent to which students learn is related to instructors' communication practices and handling of communication tools. To address this concern, it is important to develop a clear understanding of the unique nature of teaching and learning activities in distance learning programme. Specifically, the need for instructors to effectively harness the communication practice and communication tools resources to facilitate learners' engagement. As such, it is rational to argue that students' cognitive engagement in learning is the function of efficient and effective communication management by the instructors.

In addition, since the instructors are less familiar with the new teaching environment, adjusting to this unique pedagogical atmosphere with disparate teaching and learning tools has been difficult. This snowballed into mishandling or poor management of online communication tools and ineffective delivery of course contents by the instructors. Consequently, these often lead to students' failure—lowering the morale of the student to continue with their programmes, and occasionally lead to intention to discontinue from the programme. Angelaki (2013) contends that failure of students to send a single assignment for correction and less active support from the tutor or instructors are among reasons for high attrition in DL programmes. As DL instructors struggled to find their rhythm in the new teaching environment, communication tools like Learning Management Systems (LMS), Course Management System (CMS) and other distance learning communication platforms were underutilized. Findings of Rienties, Giesbers, Lygo-Baker, Ma, and Rees, (2016) showed that majority of open distance learning instructors underutilized the communication tools provided for distance learning environment. Particular reference is to the use of virtual learning system (like FrogVLE). The finding showed that instructors only use this tool as a simple repository for students to obtain study materials such as PowerPoint slides and reading lists. Other learning and interactive component are not fully utilized. This scenario is very alarming in distance learning programmes nowadays. Instructors face difficulties in using LMS to create interactive activities that truly engage students in learning (Steel, 2009). Surveys of students' perceptions of teacher's use of LMS and communication practices (knowledge building, encourage higher-order thinking and collaborative learning) continue to indicate that learners are concerned about the low levels of integration and quality of use of LMS in universities (Steel, 2009; Kaur, 2006; Dzakiria, 2012). According to Kaur (2006), "On the whole, learners were less happy with the quality of contents discussed in the online forum as compared to tutors" (p. 57). Rajasegeran (2012) said "online mathematical courses, technologies must be fully utilized to substitute the role of physical lecturers/teachers of the face to face learning environment" (p. 5). A handful of distance learning tutors in Malaysia institutions of higher learning demonstrate effective teaching to improve interaction and connectivity among learners (Kaur, 2006; Dzakiria, 2012).

The present study aimed at examining the relationship between communication management components (communication practices and communication tools) and distance learners' cognitive engagement, in doing so, the study sought to clarify the meaning of communication management construct itself. Accordingly, the study served as foundation of a rating scale that would produce valid and reliable scores to assess distance-learning instructors' communication management competency towards handling distance learning communication tools. Specifically, the study empirically tested the probability of a three-common-factor for communication management in distance learning programme.

Communication Management and Student Engagement Theory

This study is affected by transactional distance learning theory. To a large extent, Moore's Transactional Distance Learning Theory has opened-up a new pathway into distance education programmes and pointed out the important research directions (Gorsky & Caspi, 2005). Presently, Transactional Distance Learning Theory (TDLT) is useful in the discussion of distance education literatures. Many researchers now view it as a foundation framework for understanding distance education systems. According to Jung (2001), "Transactional Distance Theory provides a useful conceptual framework for defining and understanding distance education in general" (p. 527). Transactional distance theory is rooted in the assumption that the word distance in distance education is more of pedagogy than a geographic separation of instructors and students. That is, *"distance"* may be a driving force, in helping individual learners or group to wrest the control of their learning from educational institution (Moore & Kearsley, 2005). The theory emphasizes the importance of the effective management of interaction between learners-content, learner-learner, learner-teachers (communication practices) (Holmberg, 2001) as well as learner-interface (communication delivery tools) in reducing the transactional distance between instructors and learners (Creedon, 2007; Dzakiria, 2012).

Transactional distance theory looks into the unique organization and unique teaching behaviours of instructors in distance education. Transactional distance in education usually occurs whenever students did not take interest in their learning or are not engaged in meaningful dialog especially with their instructors (Saba, 2000; Stirling, 1997). Transactional distance learning theory postulated that effective communication reduces transactional distance in educational programme. In other word, the use of electronic device that relied heavily on communication technology will not only curtail the distance between learner and instructor, but also foster learning in distance education (Hillman, Willis, & Gunawardena, 1994). Moore and Kearsley (2005) stated that communications spaces between learner and his/her instructor are not always synonymous. In other words, transactional distance constructs are continuous rather than a discrete variable. In addition, within the family of distance education programmes there are variations of transactional distance (Moore, 2005). Although, Moore have argued that it will be a gainsaying that transactional distance is a relative rather than an absolute variable. This is particularly true because other variables that shape instructor and learners' behaviours besides those of teaching and learning exist in distance education environment. Therefore, there is need for other theories that can fill the vacuum. These may include education administration; a theory of distance education history; a theory of distance learner motivation and so on (Moore & Kearsley, 2005). However, these theories are yet to be propounded. Therefore, transactional distance learning theory still offers explanation of relationships that is shaped around most constructs in distance education field - namely, management of the structure of instructional programmes, the interaction between learners and teachers, and the nature and degree of self-directedness of the learner (Moore & Kearsley, 2005).

The hypothesized model in Figure 1.0 summarized the variables that guide the present study. Communication practices construct encapsulates different forms of interactions that takes place between the instructors and learners in and outside the class Moore and Kearsley, (2005). Communication tool on the other hand is composed of learner-interface (Hillman et al., 1994; Fallon, 2011; Anderson, 2003; Creedon, 2007; Dzakiria, 2012). Moore and Kearsley (2005) said, "By manipulating the communication media, it is possible to increase dialogue between learners and their teachers, and thus reduce transactional distance" (p. 25).
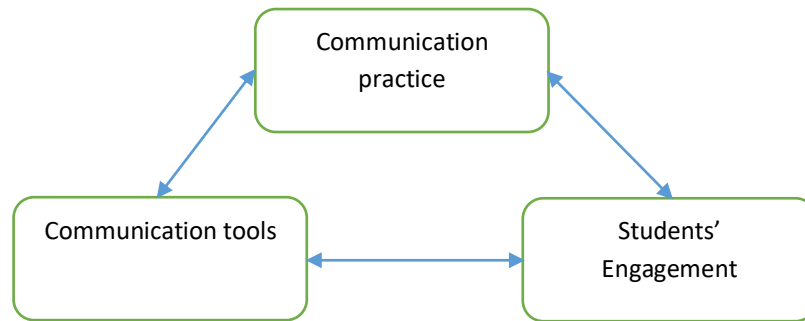
Figure 1: Hypothesized Model for Communication management in Distance Learning Programmes

Technological apparatus support for teaching and learning usually help both instructors and learners to achieve their goals (Ahmad, Basha, Marzuki, Hisham, & Sahari, 2010). Moreover, with respect to the use of communication tool in distance learning, there is high degree that the technologies that are used as media of communication would facilitate or increase practices that enhance student interaction such as timely feedback, content management presentation. Evidences from previous studies supported the leaners' expectation that technology improves practices such as timely feedback from lecturers, responses to forums and students' interactions (Angelaki, 2013). Based on these evidences, the current study hypothesized that:

H_1: communication practices have relationship with communication tool

For students to be actively engaged in learning, instructors must seek to ensure that communication practices— that facilitate dialogue (learner-learner, learner-teacher and learner-content) such as instructional materials, course design, learning devices, clarity of language and timely response to students' questions are well organized (Moore & Kearsley, 2012). In relation to this argument, this study hypothesized that:

H_2: Communication practices has relationship with distance learners' cognitive engagement

The use of discussion in distance education courses, must allow the students to "build a sense of community". Building sense of community as argued by Appana (2008) means that students could return to the dialogues that take place during lecture period later and re-examine issues and/or to remind themselves of the discussions that took place. This will eventually activate participation and increase engagement. Participation as illustrated by Al-Shalchi (2009), is the ability of the learner to reflect on thought whether the course has encouraged him/her to look at the subject from a different perspective. Via the teaching processes such as content management and course planning instructors will be able to exhibit a special teaching required in distance learning, and thus improve students' participation and interaction (Moore & Kearsley, 2005). Computer-mediated (communication tools) tools have a great potential in achieving the learning objective for both student and instructors (Bonk & King, 1998). The use of computer-based technology influences learners' behaviour, hence learning outcome (Compeau & Higgins, 1995; Fallon, 2011; Angelaki, 2013). This study therefore hypothesized that:

H_3: Communication tools has relationship with distance learners' cognitive engagement

In the light of the preceding theory, the present study aimed to examine the relationship between communication management components—communication practices, communication tools and student cognitive engagement in distance learning programme.

METHODOLOGY

Research Design

This study used correlational research design. Correlational design was adopted in order to find-out if the data obtained from the three-communication management components have observable relationship that can further be specified in terms of magnitude and/or an increase or decrease in number of observable items that made up the latent constructs. Therefore, this research design of choice has been used to determine the relationship among communication management components, which consist of communication practices, communication tools and on students' cognitive engagement.

Population and Sampling

The populations of this research are distance-learning students in *Program Pensiswazahan Guru* (Teachers Graduate Programme) (PPG) from three universities in Malaysia. These universities are International Islamic University (IIUM), University Pendidikan Sultan Idris (UPSI) and University Sains Malaysia (USIM). The total population from these universities is four thousand four hundred and sixteen (4116) PPG learners. Using Systematic random sampling procedure, 405 students were selected. This sample size is adequate in terms of providing sufficient estimates of the population parameters. According to Hair, Black, Babin and Anderson (2010), sample size of >= 200 respondents are deemed appropriate in determining the psychometric properties of latent constructs by using Confirmatory Factor Analysis (CFA). Therefore, the sample size requirements in this study are based on structural equation modelling (SEM). Thus, the researcher put up for the ratio of 10 respondents per parameter (Hair et al., 2010). The researcher obtained 405 samples for an instrument of 40 questions. Before employing this technique, the researcher identified two basic components namely the confidence interval and the margin of error. The confidence interval was set at 95% and the margin of error was set the lowest margin of error ± 5%. At this level, the difference between estimation from the sample and real population characteristics is around ± 5% (Sekaran & Bougie, 2010; Vockell & Asher, 1995).

Instrumentation

A pool of 63 items were adopted and adapted from Kaur (2006) and other literature. There is no evidence that CFA was conducted to validate items in the questionnaire. The items were modified to soothe communication management in distance learning programme sub-constructs. Each of the indicator was written in a way that it captures the underlying meaning attributed to one of three-communication management in distance learning factors. Theoretically, the latent construct for the first five items in the questionnaire was communication practice (COMPRAC); this is followed by another four indicators for communication tools (COMTOOL); followed by another four items that measured student engagement (STUDENG). Principal component analysis was used to examine the initial construct validity of the 40-items (out of 63 initial items) communication management in distance learning programme. Responses collected from 120 for three-factor solution accounted 50.70 % total variance explained. The instrument of communication management and students' cognitive engagement was assessed through students' responses on their interaction with their instructor in distance learning courses. The instrument includes no negatively worded items with closed ended questions. The original version of the instrument used only positive scales with a 6-point Likert scale. The scale of the questionnaire was reduced to 5-point Likert scale, which ranges from 1 to 5; with higher score indicating high need for effective instructor's communication, effective communication tools and high engagement. Furthermore, with 5-point scale, a midpoint to avoid forced response was included in the modified questionnaire. Thus, scale 'undecided' was used as the middle point referring to a neutral answer.

Although, some authors caution that the inclusion of midpoint in scale attracts more negative answers from respondents (Nowlis, Kahn, & Dhar, 2002). Velez and Ashworth (2007), and O'Muircheartaigh, Gaskell, & Wright (1995), also argued that the inclusion of a midpoint in scale will result in the inability or unwillingness of the respondents to make the required trade-offs decision to choose sides. However, Bond and Fox (2007) suggested that having a balanced response category in scale will not only provide respondent with more attitudinal response options, but also increases the reliability of the items. Therefore, the researcher adopted a 5-point scale with a balanced response and mid-point as suggested by Bond and Fox (2007).

Data Collection Procedure

The researcher discussed with the authorities of each selected university, precisely the Deans, Heads of departments and coordinators of distance learning programme. After fruitful discussions with authorities of each university, permission was also sought from the programme coordinators to meet the students on the day they had face-to-face meeting. Researcher met the students on their first face-to-face meeting with their instructors at their respective universities. The students were briefed on content and importance of the research and requested their cooperation. After that, questionnaires were administered to the students and collected on the same day. Follow-up communication was carried out via email for those who did not complete the questionnaire. The percentage of the students that did not complete the questionnaire was 2.8% of the total population. The researcher also informed the students that participation in the study was voluntary, and that their responses would be kept anonymous and strictly confidential.

Data Analysis

This present study employed three stages of data analysis. The first stage involved item category function and ordering test. The second stage covered descriptive statistics—which included data screening, manipulation and data reduction. The third stage involves the confirmatory factor analysis and convergent/divergent reliability test. Statistical package for social science (SPSS) version 20.0 was used to compute the descriptive and as well as reliability. Analysis of moment structure (AMOS) version 18.0 with Maximum likelihood estimation (MLE) was used to perform confirmatory factor analyses (CFA).

Reliability & Validity

The instrument was subjected to steps involved in the face, content and construct validity. Two committee members (one of whom was a former PPG distance learning coordinator) and three PhD students— majoring in instructional technology, educational management and language and literacy, conducted the first round of face validity. The researcher improved on the instrument based on the suggestions provided. This was followed by empirical evidence on the construct validity and reliability of the instrument (see Table 2 for reliability values). Details of the whole instrument validation processes are discussed in the study.

RESULTS

Demographic Profile of Samples

Four hundred and five (405) completed sample data from PPG distance learners form the final analysis of this study. The respondents background with respect to gender included 95 males (23.5%) and 310 females (76.5%). Table 1 showed the breakdown frequency and percentage values of the respondents' demographic information.

Table1

Frequency and percentage of Demographic Characteristic of Respondents (n=405)

Characteristics	N	%
Gender		
Male	95	23.5
Female	310	76.5
Institutions		
UPSI	217	53.6
IIUM	104	25.7
USIM	84	20.7
Religion		
Islam	315	77.8
Christianity	18	4.4
Buddhist	57	14.1
Hindu	14	3.5
Other	1	0.2
Highest Education		
Secondary	50	12.3
Diploma	355	87.7
Total	**405**	**100**

This result showed that the number of female students is more than male students in distance learning programme. That is early school workforce is still dominated by women. Societal perception, status and payment might be the contributing factors. The highest education qualification obtained by the respondents is Diploma certificate (355, 87.7%) followed by secondary certificates (50, 12.3%). Majority of the respondents are Muslims (315, 77.8%), followed by Buddhists (57, 14.1%). Christians consist of (18, 4.4%), Hindus (14, 3.5%) and other religion (1, 0.2%). More than half (217, 53.6%) of the respondents are students from UPSI, followed by IIUM students (104, 25.7%) the remaining 84 (20.7%) of the respondents are from USIM. The respondents' ages are within the range of 30 to 50 years old.

Descriptive Statistics

The descriptive statistics for all 40 items of communication management and student engagement from the whole samples (N= 405) showed that the data does not violate multivariate normal distribution assumption. In the present study, inspection of bivariate scatter plots resulted oval-shaped array of points demonstrating that variables are linearly related and their variances are homogenously distributed. The means score from the 5-Likert scale range from 2.840 to 4.050 and the standard deviations from 0.656 to 1.094. The statistics values (z) of skewness index (SI) and kurtosis Index (KI), fall below the absolute value of SI $>\pm3.0$ and KI $> \pm 3.0$ indicating that all the 40 items are normally distributed, and thus suitable for any parametric statistical test as suggest by Kline (2011).

Based on the results of the descriptive analysis, communication practice, communication tools and student engagement items mean respectively are well above the anchor points of 3.00 and within the good range of standard deviation of 0.625 to 1.094 indicating a well-dispersed variation of data. In general, the statistics for skewness and kurtosis are within the accepted limits, indicating that the items are normally distributed.

As for CFA and SEM analysis, the distribution of the final 40 items was based on all 405 samples. The 40 selected items from the original 63 items had contributed to the improvement of the statistics values (z) of skewness and kurtosis, which were within the accepted limits (below ±3.0 and ±8.0).

Hypothesized Model

To validate the likelihood of the Hypothesized three-factor model, confirmatory factor analysis was conducted. The overall goodness of fit indices of the 13-items measurement model is presented in figure2. The initial 40-items were reduced to 13, due to low factor loading. The goodness-of-fit of the hypothesized model is consistent with the data. The observed covariance matrix, accounted for 90% of the proportion of variance explained. The magnitude and direction of the factor loading were substantially significant. The model is free from negative estimates, and the internal consistency values satisfied the standard deemed necessary in construction. The composite reliability value for the sub-constructs were 0.95 (Communication Practice), 0.89 (Communication tools) and 0.88 (Student Engagement) see Table 1.

Measurement Model of Communication Management in Distance Learning

Confirmatory Factor Analysis (CFA) was conducted on the hypothesized three-factor structural model using AMOS 20.0 model-fitting program. The program adopted maximum likelihood estimation to generate the whole measurement model. To assess the fit of the 40-item model, the analysis relied on number of goodness of fit (GOF) indices, Discrepancy Divided by Degree of freedom (CMIN/DF), the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA), Goodness-of-fit index (GFI), Adjusted Goodness-of-fit index (AGFI), Root mean square residual (RMR), Tucker-Lewis Coefficient TLI. According to Arbuckle and Wothke (1999), CMIN/df with a value of between 2 and 5 is considered acceptable. They further stress that the threshold values of CFI, GFI, AGFI and TLI range from zero to 1, with values close to 1 demonstrating a good fit (normally above 0.9). Finally, a value of RMSEA and RMR of ≤ 0.1 shows a reasonable error of estimation was determined.
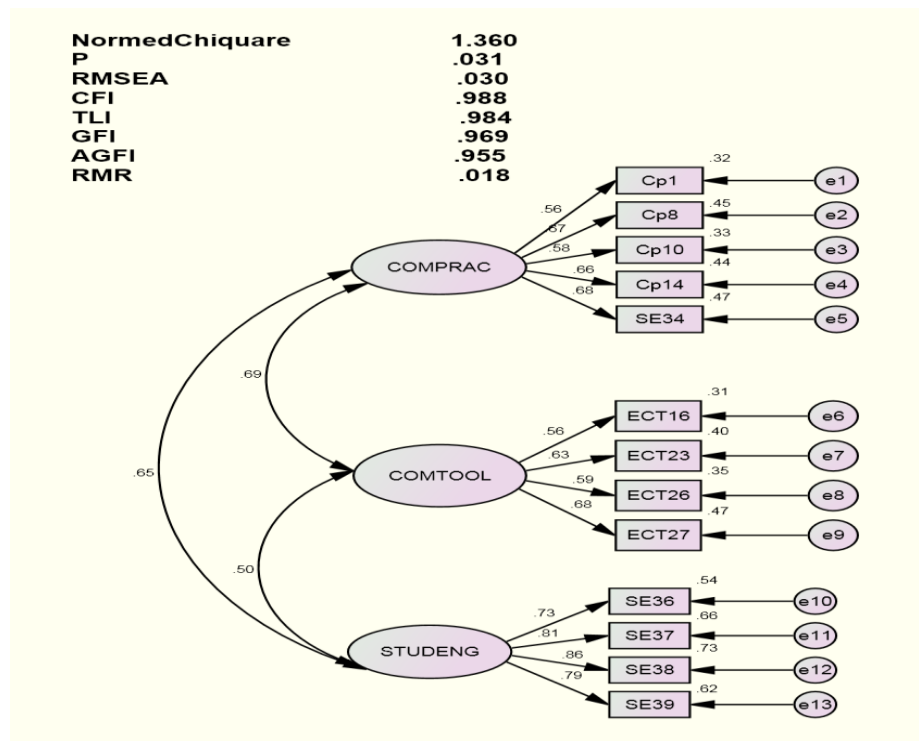

Figure 2: Hypothesized Model

The measurement model showed that the overall model fit normed-chi-square χ^2 (2)/df = 1.360 (see Figure 2). Significance chi-square indicates good fit of the data to the model. Chi-square test is biased with sample size and tends to be significant with large sample size, Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), Goodness of fit index (GFI) and Root square mean Residual (RMR) were used to establish the goodness-of-fit of the hypothesized model to the data. The CFI was 0.988 (above the 0.9 minimum), GFI was 0.984 (above the 0.9 minimum) and the RMSEA was 0.03 (within the acceptable value of ≤ 0.1). All these indicate that the revised model fit the data. Therefore, we concluded that the revised model fits the data and response to the purpose of the study.

Reliability and Convergent Validity

Reliability of the items was assessed using construct reliability (CR) and average variance extracted (AVE) and validity was assessed using convergent and discriminant. Table 1 represents the result of construct, convergent for the CFA model of communication Management in distance learning with 13 items. As shown in figure 2, all indicators have high factor loadings ranging from 0.56 to 0.81 indicating that the meaning of the factors has been preserved by these indicators. Table 2 also shows that the AVE values, which reflect the overall amount of variance in the indicators accounted for by the latent construct, were 0.399, 0.397and 0.638 for Communication practice, communication tools and student engagement. All of these values were below the cut-off 0.5 except for student engagement. Evidence of convergence validity is established only with students' engagement construct. Evidence of convergent validity seems to be daunting in other two constructs as suggested by Nunnally and Bernstein (1994).

Table 2
Validity and Reliability estimates

	CR	AVE
Communication Practice	0.95	0.399
Communication Tools	0.89	0.397
Student Engagement	0.88	0.638
Validity Concerns		

Note:
a: AVE = (summation of the square of the factor loadings)/ {(summation of the square of the factor loadings) + (summation of the error variances)}.
b: Composite reliability = (square of the summation of the factor loadings)/ {(square of the summation of the factor loadings) + (square of the summation of the error variances)}. Diagonals represent the square root of the AVE while the other entries represent the correlations.

The composite reliability values, which depict the degree to which the construct indicators indicate the latent constructs, were very encouraging. Composite reliability value is 0.95 (Communication Practice), 0.89 (Communication tool) and 0.88 (Student Engagement) see Table 1. All of these values exceeded the recommended value of 0.6 as recommended by Bagozzi and Yi (1988).

Testing the Study's Hypothesis

The models evaluated the path relationships to answer the following hypotheses:

Hypothesis 1: communication practices has relationship with communication tool

The relationship between communication practice and communication tools was found to be significant (CR = 6.729) with high positive value of correlation coefficient of 0.690 (see Fig. 2 and table 2). Thus, the hypothesis is supported. This result is in line with the contribution of communication tools to communication practices use for academic purposes in the study context, the more the instructors are confident or comfortable with the use of pedagogical tools, the more they practice communication for effective learning. In terms of a correlation coefficient, the size of the observed effect was r = .690. This, based on Cohen's Conventions is considered a strong uphill positive linear relationship.

Hypothesis 2: Communication practices has relationship with distance learners' cognitive engagement

Communication practices (COMPRAC) significantly correlate with distance learners' cognitive engagement by a standardized correlation coefficient of 0.648 (CR > 7.224). Instructors' presentation of learning materials, feedback and assessment in an interactive way positively relates to learners' cognitive engagement (see Fig. 2, table3). This based on Cohen's Conventions is considered a strong uphill positive linear relationship.

Hypothesis 3: Communication tools has relationship with distance learners' cognitive engagement

Communication tools (COMTOOL) significantly correlates with distance learners cognitive engagement by a standardized correlation coefficient of 0.496 (CR > 6.338). This base on Cohen's conventions is considered a moderate uphill positive linear relationship. From practical aspects, the result indicates the importance of training of distance education instructors on the use of communication tools for teaching and interactive purposes.

Table 3

Maximum Likelihood Parameter Estimates for 3-factor Model

Parameter	Standardized parameter	P-Value	Critical Ratio (C.R)
COMPRAC<-->COMTOOL	0.690	0.023	6.729
COMPRAC<-->STUENG	0.648	0.017	7.224
STUENG <-->COMTOOL	0.496	0.019	6.338

COMPRAC=communication practice, COMTOOL=communication tools, STUENG=student engagement

Items	Label	Factor loading
COMPRAC		
Cp1	Instructors provide more information to help students understand topic of discussion	0.564
Cp8	Interaction between instructors/facilitators and students in my class is well managed throughout the semester	0.671
Cp10	Instructors/facilitators usually initiate interesting issues for forum discussion	0.577
Cp14	Instructors' always make their expectation clear right from the start	0.665
SE34	Organization of reference materials (e.g. web link, notes) by instructor improves my willingness to engage in learning.	0.684
COMTOOL		
Ect16	I get timely information from instructor via email	0.555
Ect23	I like posting messages in the discussion board/chat-room because it is flexible to communicate with my instructor	0.629
Ect26	I received online discussion messages from myLMS on time from my instructors and peers.	0.591
Ect27	Blog is an effective tool for student-instructor interaction	0.685
STUENG		
SE36	Discussion of course with peers challenges my thinking	0.733
SE37	Inclusions of competition by instructors in discussion motivate me to prepare for response in other discussions.	0.811
SE38	Discussion of content with instructors challenges my thinking.	0.856
SE39	I like to learn new things, if the previous lesson are clearer to me	0.786

DISCUSSION

The study contributed to the development of mean, reliability and validity (psychometric properties) of instrument to assess communication management in distance learning. The results of the confirmatory factor analysis supported the assertion that communication management in distance learning is a multi-dimensional construct, the dimensions are communication practices, communication tools and students' engagement. This finding is in line with the previous studies on communication management in distance learning. The study supported the prevalence of distinctive, although interconnected facet of communication management in distance.

There are strong and moderate correlation between all the constructs. This distinctive relationship has shown that as distance learners (PPG) experience their instructors to be versatile at using diverse features in communication medium such LMS, email and Facebook (communication tools), they felt that their lecturers established interaction—which include feedback on assignment and organized material (communication practices) for them. Wahlstedt and Honkaranta (2007) supported and asserted that communication tools like LMS, emails, Facebook etc., have provided tremendous prospect for students' interaction and prompt feedback. The need for communication that fosters interaction between students and content, students-students, students-lecturer and students-interface ultimately improves positive learning behaviour and is supported by Moore (1993), Anderson (2003) and Dzakiria (2012). Thus, it can be concluded that 69% of the number of times the respondents (the in-service teachers) experience communication practices (presentation of interesting e-forum discussions and well-organized reference of study materials) in distance learning programme is attributable to efficient utilization of communication tools such as private emails, myLMS and use of Blog and Facebook by the instructors. While the remaining 41% of the number of time the student experience good communication practice is due to other reasons. Therefore, the more the instructors in distance learning utilize the features available in myLMS, blogs and private emails in teaching, the greater the students experience efficient communication practices. This finding contrast that of Moore and Kearsley (2005) who cautioned distance learning handlers of the impending risk of investing much on communication tools for teaching and learning at the expense of content-based training for instructors. However, based on the finding of this study, the impending risk of underutilization of communication tools by instructor due content-ability-technology mismatch identified by Moore can be circumvented with consistent practice and use of the latest teaching aids by the instructors.

In tandem with Burgess (2006), communication practice (interaction and teamwork among students and cooperation between students and instructors) is necessary for learners' creative and critical thinking in a genuine context. In addition, this study is in support with McGivney (2004) and Khan (2005) which view managing learning resources such as course content and presentation together with an interactive learners' group promote higher thinking and self-directed distance learning students' feedback from tutors. This study is supported by findings of Yu and Yu (2002) and Almrashdeh et al. (2010). The studies confirmed that relationship between communication tools and students' engagement is viable in promoting students' cognitive growth and engagement especially in distance learning. Sadat and Rahman (2003) in their study on Bangladesh Open University students, also find out that email and Facebook are effective tools for interaction as well as to make a bridge of communication barrier between both tutors and learners. In the study by Sharifah and Zahra (2015), a significant relationship was found among variables such connectivity, assessment and feedback and collaboration in predicting student engagement when learning via communication tools like Facebook.

CONCLUSION AND IMPLICATION

Findings of this study indicated that instructors who put communication practices into play would help student to have mental engagement in learning. They will also have developed skills in use of distance learning communication tools. Instructors who are active in using online communication tools like LMS, WiZiQ, email, WhatsApp, Facebook would encourage interaction, participation and cognitive engagement learners. This study has implications for distance learning education instructors and administrators. Since the 13-items three factors model yielded a valid and reliable communication management scale, therefore the scale is useful in conducting diagnostic valuation of communication between instructors and distance learners. The findings of the evaluation would enable distance learning administrators, instructors and students to understand the unique nature of online teaching and learning (on like the conventional face-to-face) better. This will enable both administrators and instructors to design the instructional material that can be used to further improve learners' cognitive engagement and reduce the transactional distance between learners and instructors. In summary, this study can guide future efforts in enabling distance education administrators and instructors to help learners attain meaningful learning.

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EDUCATIONAL MANAGEMENT
(MOJEM)

Previous researches and literatures have revealed that students' cognitive engagement can be influenced by composite of—student-learning competency, socio-economic predisposition of learners, highly structured course content and repetitive teaching. This study however, has supported that in the context of distance learning; instructional practices and effective utilization of communication tools by instructors/lecturers/tutors could as well provide alternative measure variables that work well on students' cognitive engagement especially in distance learning programme. It can be concluded that if distance-learning students are provided with self-digested learning materials, well-organized contents, regular feedback and the use of multiple communication tools, they will experience high-level engagement in learning.

The correlation between the communication practice and communication tools indicated an interaction between students-students, students-content, students-lecturer and student-interface. Distance learning instructors who are prudent in handling communication medium will in turn promote regular feedback on students' assignments, provision of self-explanatory course materials for students and ability to organized course content in a more interactive way. This information provides an extension of the literature in communication management and distance learning management framework.

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Appendix:
Questionnaire

COMMUNICATION MANAGEMENT IN DISTANCE LEARNING

Please indicate by putting a tick (/) to respective column if you agree with the items listed in each dimension.

S/N	COMMUNICATION PRACTICE
1	Relevancy of online discussion content will promote communication with my peers
2	The online discussion content should be continuation of discussion from the face-to-face tutorial classroom
3	Clear instruction on topic to be discussed in will increase interaction between the tutor and students
4	Instructors should initiate forum discussion that encouraged all classmates to interact with each other
5	Interaction between the tutor and students should be well distributed throughout the semester
6	Discussion of content with instructor should be challenging
7	Use of pictorial explanation of course content will help me understand difficult content better.
8	Integrating online discussion content with discussion from the face-to-face tutorial classroom clears my doubt
9	Reference of study materials (e.g. web link, notes) should be well organized by instructor
10	I like to get timely feedback to my questions from course instructor
11	Getting related information from instructor increases concentration on my course.
12	I understood the tutor's feedback.
13	Pictures should be used by instructors to describe scenario for students in the discussion forum.
14	Instructor should acknowledge my contribution in during discussion forum.
15	Inclusion of competition in discussion will motivate me to prepare for response in other discussions.
16	Presenting more thought-provoking issues by instructors during discussion will increases my readiness to learn.
17	Making the expectation of the instructors' clear right from the start will increase cooperation.
18	I wish I could communicate more with instructor and other students
19	Instructors should not go on to new things until they know that I understand the old ones.
20	Instructors should ensure that they don't teach faster than I can learn
21	Additional support should be provided by instructor where there is missing to help interpret communications
COMMUNICATION TOOLS	
22	I am able to access myLMS easily
23	When I post my responses, the time taken for the server to process was fast.
24	When I post my responses, I have a time-out problem and as such, I lose my messages.
25	I am happy with the way the discussion forum is displayed on the screen.
26	Live lectures and face-to-face tutorials are good tools, but other delivery forms can be as rich, and may allow multiple use of the same material
27	Strategic, rather than uniform, use of Web 2.0 tools is preferable
28	Blended or mixed-mode teaching fosters more types and modes of social contact than either face-to-face or online alone
29	I enjoy posting messages in the discussion board/chat-room
30	I noticed that most students are active in sending postings to the group Blog
31	I prefer to post response directly to instructor via email
32	Using email to communicate will increases my interaction with instructor and other students.
33	I like to get timely information from instruct via email
34	Using email as communication tool in distance learning courses will increases feedback between instructor and learners
35	Use of face-book to for discussion will promote interactive learning
36	Faculty need to provide constant technical support in hardware, general software and specific software applications
37	Instructor should help in familiarizing learners with computers and managing limited hardware resources
38	Students need to be taught certain skills such as using a search engine and how to manage MS Windows
39	I think student need support on how to access the myLMS, button functions and navigation as well as how to input information and save it
40	I think marks should also be given to student that other alternative communication tool (email, face-book etc)
41	Faculty need to provide constant technical support in general and specific software in delivery learning

No	Cognitive Engagement
41	Interaction between the tutor and students helped me in my learning of the course
42	I like to stay long in discussion forum when the topic is thought-provoking
43	When I post my responses, I have a time-out problem and as such I lose my messages.
44	A well display discussion forum on the screen will increase my attentions for learning.
45	I will like to contribute to class discussions anywhere I am
46	I can learn from the course materials if they are self-explanatory.
47	I care about learning new things if the old lectures are clear to me
48	I can do well in my course(s) if I get regular comment on my work
49	I can come up with my own solutions to problems if the course taught are tailored towards this
50	I like to participate in discussion when new material is being discussed
51	I can complete course assignment on time if the instruction on how to do it is well communicated.
52	I will become more actively involved in courses discussions if communication medium like email, iCHAT and Facebook are used
53	I have gained valuable learning experiences from my courses
54	The assignments for courses I offered so far are relevant and useful
55	The workloads for my courses are appropriate for the hours of credit.
56	I think and reflect on the questions posed in the discussion board before offering a reply
57	Discussion of content with instructor challenged my thinking.
58	Organization of reference materials (e.g. web link, notes) by instructor will improve my preparation for course.
59	Getting timely feedback to my questions from course instructor will help in completing my tasks
60	Getting correct feedback to from instructors on questions posted will make finish my assignment on time.
62	Getting related information from instructor increases concentration on my course.
62	Use of Pictures to describe scenario encouraged me to participate in the discussion forum.
63	Instructors' feedback on my work will increase my grades.