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INTRODUCING MOBILE INTERNET AS A LEARNING ASSISTANT FOR SECONDARY AND HIGHER SECONDARY STUDENTS

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ABSTRACT

The growth of introducing mobile learning has dramatically reshaped teaching and learning processes in education (Hwang & Chang, 2011; Marwan, Madar, & Fuad, 2014; Wu, Hwang, Su, & Huang, 2012). The use of smart phones offers a powerful learning environment and can transform the learning and teaching process so that students can deal with knowledge in an active, self-directed and constructive way (Cheon, Lee, Crooks, & Song, 2012). At present the smart phone is considered an important means to promote new methods of instruction (teaching and learning). It can be used to develop students' skills for cooperation, communication, problem solving and lifelong learning (Gikas & Grant, 2013). By adopting mobile internet, we can offer high quality education. Chhachhar, Makhijani, Khushk, and Maher (2013) identified four distinct faces of quality education, which can be supported by ICT: learning by doing, real time conversation, delayed time conversation and directed instruction. Higgins and Associates (2003) and Rau, Gao, and Wu (2008) suggested that the use of ICT and mobile internet could improve performance, teaching, and administration, have a positive impact on education as a whole. The information and communication technology (ICT) revolution brings specific challenges to education systems around the world. Due to its easy accessibility this means of education using ICT has become very popular all over the world. In this present world the smart phone is part and parcel of the modern communication system. With the benefits of the internet service, especially mobile internet service like 3G and 4G, the worlds' information is on hand to everyone. This paper intends to present an idea about mobile internet based education all over the globe and its applicability in Bangladesh along with investigating the developing progress of ICT in educational institutions and educational organization related activities and provides comprehensive recommendations to build better learning in Bangladesh in the near future.

JEL Classifications: I20, I25
Keywords: ICT, Mobile Internet, Educational system, Bangladesh.
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INTRODUCTION

Mobile learning is a new form in the development of e-learning and distance learning process (Abu-Al-Aish & Love, 2013). It means acquiring knowledge via mobile devices with the help of the internet. Using mobile technology to reach students will benefit higher education. A positive relation between ICT learning and mobile learning facilitates evidence based learning. Many educational institutes are operating distance learning through mobile internet to provide flexibility in the learning process (Ally & Prieto-Blázquez, 2014). There are some trends to lead the traditional learning process, which are changing gradually and randomly. Among these the following are very popular forms like electronic learning (E-learning), mobile learning (M-learning) or ubiquitous learning (U-learning). Mobile learning is an effective and flexible way of learning. It can overcome restrictions of time and space, enabling learners to study whenever and wherever possible (Begum, 2011; Chen & Chung, 2008).

Over the past two decades, technology devices have become tiny like mobile phones to the point that they have become widespread in everyday life (Page, 2014) and this device has become common among a wide range of students (Park, Nam, & Cha, 2012). With the fulminant and rapid growth of the Internet, mobile networks, mobile applications, and cloud computing, cloud based mobile learning was introduced as a powerful technology for mobile devices. Mobile devices, in particular the mobile phone, are ubiquitous amongst the whole world population (Masud & Huang, 2013). Many countries have restructured their school curriculum to establish technology as a key learning area that is why they include the technological nature of society, enhancing the opportunities and possibilities for developing higher skills, including creative thinking and problem solving (Banks & Chikasanda, 2015). This paper discusses the modern educational needs of present students. We highlight the traditional ways of teaching and focus ICT disciplines. In this article we try to report learning experience in Bangladesh and find some important factors which are very much essential to develop the modern education system in Bangladesh. We offer new learning approaches and ways to improve the quality of ICT teaching using mobile devices and also explore effective new students' learning methods as well as knowledge acquiring process in a competitive learning way.

LITERATURE REVIEW

Mobile internet as an assistant in the education sector delivers a whole process of education system administration and management (Bidaki, Sanati, & Ghannad, 2013). Implementing information and communication technology like cell phone devices in the education system leads to global access for all to education, and demand for education ensures quality teaching procedures and learning methods (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012). In developing countries distance learning using mobile internet is a popular form and started, as in many countries, with correspondence courses where traditional learning materials used to be dependent on the students on a regular basis. Where the concept of mobile learning is very much in vogue in developed countries the basic philosophy was teachers would be physically away from the students and have to conduct the teaching process from a distance (Deb, 2011).

The growth of introducing mobile learning has dramatically reshaped teaching and learning processes in education (Hwang & Chang, 2011; Marwan, Madar, & Fuad, 2014; Wu, Hwang, Su, & Huang, 2012). The use of smart phones offers a powerful learning environment and can transform the learning and teaching process so that students can deal with knowledge in an active, self-directed and constructive way (Cheon, Lee, Crooks, & Song, 2012). At present the smart phone is considered an important means to promote new methods of instruction (teaching and learning). It should be used to develop students' skills for cooperation, communication, problem solving and lifelong learning (Gikas & Grant, 2013). By adopting mobile internet, we can offer high quality education. Chhachhar, Makhijani, Khushk, and Maher (2013) identified four distinct faces of quality education, which can be supported by ICT: learning by doing, real time conversation, delayed time conversation and directed instruction. Higgins and Associates (2003) and Rau, Gao, and Wu (2008) suggested that the use of ICT and mobile internet could improve performance, teaching, and administration, have a positive impact on education as a whole. Technology should be used as a tool to support educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving - which are important for the preparation of children for the knowledge society (Tynjälä, Häkkinen, & Hämäläinen, 2014). ICT (computers, Inter and Intranet) can be used to create new types of interactive learning media for improved quality, equity, and access in higher education (Zhao, 2013). In order to best use the technologies in education, new learning methods may, and probably will, be required.

The relationship between the use of mobile internet and student performance in secondary and higher secondary education is not clear, and there are mixed results in the literature (Kinash, Brand, & Mathew, 2012). Internet is used as a productivity tool; this generally means that it can change the traditional methods of teaching and learning into making a digital world (Valacich & Schneider, 2014). Students are also led to more individualized commands, less moral delivery, and an emphasis on problem-solving and cooperative learning situations. These can develop broad, ethnical skills to use in problem solving, independent and collaborative learning, and communication by using the internet (Cha et al., 2011). Instructors become facilitators and skills developers. They help the students acquire a greater understanding of information by making use of new technologies like the internet. In the traditional system students have typically been submissive in accepting what has been delivered from the higher level authority (Nyachwaya et al., 2011). The use of internet, such as mobile internet, gives many alternatives and choices and many institutions are now creating competitive borders for themselves through the choices they are offering students (Aypay, 2010).

The advent of mobile internet as a learning technology has coincided with a growing awareness and recognition of alternative theories for learning (Zhou, 2011). The theories of learning that hold the greatest shift today are those based on constructivist principles. However, investment in ICTs has been controversial (Avgerou, 2010). Opportunities offered by mobile internet-based education may not be beneficial to all learners especially those who are out of range of ICT. The benefit of establishing and maintaining the program economically, culturally, socially or politically must be affordable as a globalized system of education (Wastiau et al., 2013). Ma, Andersson, and Streith (2005) opined that: (1) the student teachers' perceived usefulness of computer technology had a direct significant effect on their intention to use it; (2) the student teachers' perceived ease of use had only

an indirect significant effect on intention to use; however, (3) the student teachers' subjective norm, that is the possible influence of external expectations, did not have any direct or indirect significant effect on their intention to use technology.

METHODOLOGY

In order to achieve the objectives of this study we have used primary sources of information. Primary data have been taken from the respondents through a structured questionnaire that included Likert scale questions which contain 1 to 5 points. "1" indicates strongly disagree and "5" indicates strongly agree. Questionnaires offer a method of conducting a survey where all respondents are asked exactly the same questions under the same circumstances. In this research, the questionnaire survey was conducted to identify the status of the M-learning in the five secondary and higher secondary educational institutions of Bangladesh. The students enrolled in these criteria who have a smart phone (also guardian) and who use internet on his or her mobile were selected. A structured questionnaire was formulated in order to identify different ways of using m-learning and the efficiency of using the m-learning. Secondary data were collected from published journals both locally and internationally. The statistical package used to conduct the various analyses is the SPSS 20 and SPSS AMOS 22.

Sampling

A total of 5 (five) secondary and higher secondary educational institutions were surveyed in Dhaka city and Gazipur region in Bangladesh. This survey was conducted in December, 2014. The database of the school survey was used as the sampling frame for selecting the schools which use the mobile device (Smart Phone) as assistive tools to teach the students. All the respondents were students of those institutions who were representing their institutions.

Sample Selection

There is no assent regarding the ideal sample size or subject-to-variable ratio. This is a necessary deliberation to obtain factor structure (Norris & Lecavalier, 2010). One frequently cited rule is to include five participants per variable and at least 200 participants' total. A 5:1 ratio is echoed by (Dupuy & Nassar, 2014) but they offered the caveat that this was only sufficient if the total sample was larger than 100 participants, while the ratio should be 10:1 if there were fewer than 100 participants in the sample then the necessary sample size to produce a stable solution ballooned to 150-200 participants.

FINDINGS

Exploratory Factor Analysis

This study entails "Introducing Mobile Internet as a Learning Assistant for Secondary and Higher Secondary Students: A Case in Bangladesh". The purpose of the study is to identify the component that influences the greater impact of mobile learning to the learner. Findings

of previous studies related to this issue are also taken into consideration. Fifteen (15) correlated variables are selected from related literature. Factor analysis has been conducted to reduce the number of total variables. Bartlett's test of Sphericity has been used along with the Kaiser-Meyer-Olkin (KMO) statistic. Some suggestions for the institutes are also made to enhance the level of their students' overall progress. Most often impact of mobile learning measured by surveys and much of that literature deals with the validity and reliability of those surveys. Impact and development of mobile internet can be measured using a 5-points Likert scale where 1 indicates Not At All good and 5 indicates completely effective from these scales, a Co-efficient of Determination can be calculated to check the model fit.

A useful statistic is the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. This index compares the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. Small values (below 0.5) of the KMO statistic indicate that the correlations between pairs of variables cannot be explained by other variables and that factor analysis may not be appropriate.

TABLE 1. KMO TEST TABLE

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.730
Bartlett's Test of Sphericity	Approx. Chi-Square	855.487
	df	105
	Sig.	0.000

Consequently, from the above table, it is apparent that factor analysis is appropriate. Here, the KMO value is 0**.**730, which is between 0.5 and 1.0 and the result is excellent, and the approximate chi-square statistic is 855.487 with 105 degrees of freedom, which is significant at the 0.05 levels. This analysis divulges the most important factors that contribute to the improvement of the impact of ICT of Bangladeshi students. The variables which are used in the study are as follows:

V1	Have Smart Phone	V9	Look up New Idea on Internet
V2	Sufficient internet facility	V10	Watch YouTube for lecture
V3	M. internet E-mail interaction	V11	Team Collaboration by M. Internet
V4	Visit different blog & web site	V12	Reading online newspaper
V5	Practice E-book	V13	Online Quiz Test
V6	Accessibility Anywhere	V14	Online Chat for Group Study
V7	Browse Social Network	V15	Independent Learning
V8	Gives Immediate Support		

TABLE 2. TOTAL VARIANCE EXPLAINED TABLE

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.920	26.134	26.134	3.920	26.134	26.134
2	1.964	13.094	39.227	1.964	13.094	39.227
3	1.746	11.643	50.870	1.746	11.643	50.870
4	1.290	8.602	59.472	1.290	8.602	59.472
5	1.019	6.796	66.268	1.019	6.796	66.268
6	0.835	5.570	71.838			
7	0.738	4.918	76.756			
8	0.631	4.205	80.960			
9	0.591	3.940	84.901			
10	0.510	3.400	88.301			
11	0.475	3.168	91.469			
12	0.383	2.553	94.022			
13	0.349	2.325	96.347			
14	0.287	1.911	98.258			
15	0.261	1.742	100.000			

Extraction Method: Principal Component Analysis.

From the above table of Total Variance Explained, only 5(five) factors have been extracted, as the cumulative percentage is greater than 66% at this point and eigenvalue is greater than 1.0 (it is recommended that factors with eigenvalues greater than 1.0 should be retained) that indicates the adequacy of the analysis using derived factors.

TABLE 3. PATTERN MATRIX TABLE

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
V14	0.768				
V15	0.745				
V13	0.714				
V12	0.656				
V5		0.871			
V4		0.792			
V6		0.716			
V2			0.845		
V1			0.797		
V3			0.665		
V11				0.823	
V10				0.703	
V8					0.781
V7					0.700
V9					0.640

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

TABLE 4. RELIABILITY TEST

Reliability Statistics

	Factor	**1**	**2**	**3**	**4**	**5**
Reliability Statistics	Cronbach's Alpha	0.752	0.763	0.684	0.644	0.648
	N of Items	4	3	3	2	3

From the Cronbach's Alpha test by using SPSS 20 factors will be reliable if the value is more than 0.6. So from that point of view the factors are reliable, because all the value above 60%.

EXPLANATION

The extracted 5 factors can be interpreted in terms of the variables that load high coefficients. From the rotated component matrix table, factor 1 has high coefficients for variable V14 [Online Chat for Group Study] (0.768), V15 [Independent Learning (0.745), V13 [Online Quiz Test] (0.714), V12 [Reading online newspaper] (0.656). Thus, factor 1 can be entitled as "Distance Learning by M-Internet". Factor 2 has high coefficients for V5 [Practice E-book] (0.871), V4 [Visit different blog & web site] (0.792), V6 [Accessibility Anywhere] (0.716). Thus, this factor may be labeled as "Study Anytime Anywhere". Factor 3 has high coefficients V2 [Sufficient internet facility] (0.845), and V1 [Have Smart Phone] (0.797), and V3 [M. internet E-mail Interaction] (0.665). Hence, this can be tagged as "M-Learning". Factor 4 has component that V11 [Team Collaboration by M. Internet] (0.823) and V10 [Watch YouTube for Lecture] (0.703). So, this factor can be named "M-Collaboration". Factor 5 has high coefficient for V8 [Gives Immediate Support] (0.781), V7 [Browse Social Network] (0.700) and V9 [Look up New Idea in in Internet] (0.640), so these factors can be named "M-internet for Quick Feedback". In a general point of view, however, the overall impact of M-internet on student learning can be measured through the following equation:

$$L = \propto + \beta_1 F_1 + \beta_2 F_2 + \beta_3 F_3 + \beta_4 F_4 + \beta_5 F_5 + \varepsilon \quad (1)$$

Where L = Impact of M-internet on student learning; F_1 = Distance learning by M-internet; F_2 = Learning flexibility (learning anytime anywhere) through M-internet; F_3 = Direct leaning through M-internet; F_4 = M-collaboration through M-internet; and F_5 = M-internet for quick feedback.

Confirmatory Factor Analysis

We would like to examine additional indices of model fit – most of which are not formal inferential statistics. For example, we examine indices such as the Goodness of Fit Index (GFI), the Incremental fit Index (IFI), the Normed Fit Index (NFI), the Comparative Fit Index (CFI), the Non-normed Fit Index (NNFI, also known as the Tucker-Lewis Index or TLI), the Root Mean Square of Approximation (RMSEA), the Root Mean Square Residual (RMR), the Standardized Root Mean Square Residual (SRMR), and the Akaike Information Criterion (AIC), to name but a few. The fit indices have differing scales and norms for indicating model adequacy – for example, large values of the GFI (up to 1.0) indicate good fit, but small values of the RMR (down to 0) indicate good fit. Many sources provide guidance for interpreting the various fit indices (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1995; Hu & Bentler, 1999).

TABLE 5. SEM MODEL FIT

Fit Index	Recommended Value	Observed Value
CMIN/ degrees of freedom	≤3.00	2.155
GFI	≥0.90	0.901
AGFI	≥0.80	0.852
NFI	≥0.90	0.905
CFI	≥0.90	0.881
RMSR	≤0.10	0.090
RMSEA	≤0.06 OR ≤0.08	0.078

GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index;
NNFI = non-normed fit index; CFI = comparative fit index;
RMSR = root mean square residual;
RMSEA = root mean square error of approximation.

FIGURE 1. PATH DIAGRAM

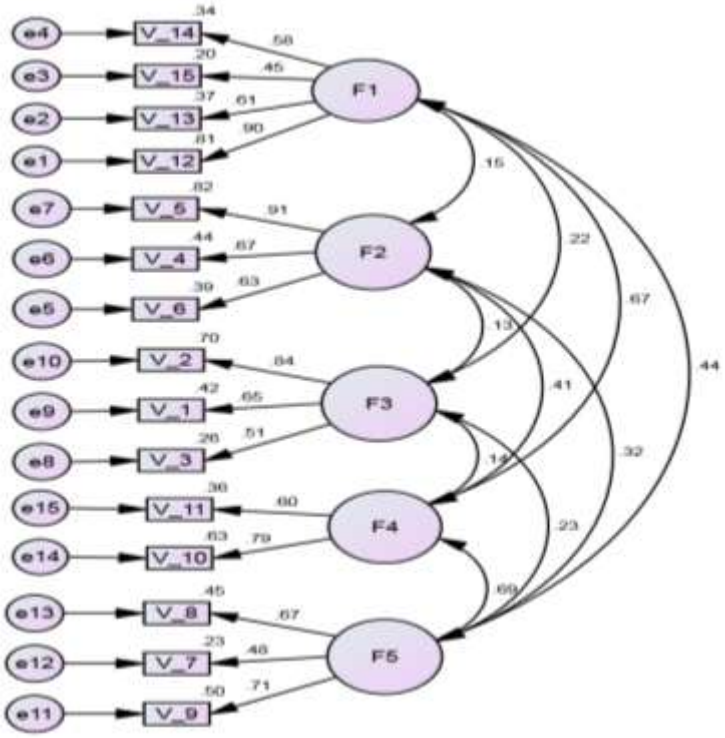


TABLE 6. UNSTANDARDIZED & STANDARDIZED REGRESSION WEIGHT

Unstandardized Regression Weights: (Group number 1 - Default model)							**Standardized Regression Weights**
			Estimate	S.E.	C.R.	P	Estimate
V12	<---	F1	1.000				0.901
V13	<---	F1	0.635	0.081	7.884	***	0.610
V15	<---	F1	0.505	0.087	5.819	***	0.449
V14	<---	F1	0.640	0.085	7.533	***	0.581
V6	<---	F2	1.000				0.627
V4	<---	F2	1.053	0.141	7.495	***	0.666
V5	<---	F2	1.526	0.205	7.456	***	0.905
V3	<---	F3	1.000				0.512
V1	<---	F3	1.209	0.213	5.665	***	0.647
V2	<---	F3	1.436	0.276	5.204	***	0.836
V9	<---	F4	1.000				0.707
V7	<---	F4	0.745	0.144	5.164	***	0.476
V8	<---	F4	1.040	0.162	6.408	***	0.674
V10	<---	F5	1.000				0.791
V11	<---	F5	0.790	0.115	6.896	***	0.601

Generally, estimates of unstandardized regression weight refer that when one factor goes up to 1 then the other related one goes up the estimated value. For example, when F1 goes up by 1, V13 goes up by 0.635. The regression weight estimate, .635, has a standard error of about .081 and also when dividing the regression weight estimate by the estimate of its standard error gives $z = .635/.081 = 7.884$. In other words, the regression weight estimate is 7.884 standard errors above zero. The probability of getting a critical ratio as large as 7.884 in absolute value is less than 0.001. In other words, the regression weight for F1 in the prediction of V13 is significantly different from zero at the 0.001 level (two-tailed). On

the other hand, with the value of standardized regression weight when F1 goes up by 1 standard deviation, V12 goes up by 0.901 standard deviations.

TABLE 7. COVARIANCE AND CORRELATION

			Covariances: (Group number 1 - Default model)				**Correlations**
			Estimate	S.E.	C.R.	P	Estimate
F1	<-->	F3	0.154	0.069	2.236	0.025	0.216
F1	<-->	F2	0.132	0.079	1.678	0.093	0.146
F2	<-->	F3	0.068	0.049	1.397	0.162	0.130
F2	<-->	F5	0.289	0.078	3.722	***	0.408
F1	<-->	F5	0.646	0.106	6.116	***	0.675
F3	<-->	F5	0.075	0.057	1.326	0.185	0.135
F2	<-->	F4	0.211	0.071	2.990	0.003	0.319
F3	<-->	F4	0.117	0.056	2.083	0.037	0.226
F4	<-->	F5	0.486	0.092	5.308	***	0.693
F1	<-->	F4	0.393	0.095	4.143	***	0.440

All the covariance estimating the standard error are not bad and also the correlations are good. The probability value of the results is excellent without the relation between F1 and F2, F2 and F3 and F3 to F5. For example, the covariance between F1 and F3 is estimated to be .154. The covariance estimate, 0.154, has a standard error of about 0.069. Dividing the covariance estimate by the estimate of its standard error gives z = 0.154/.069 = 2.236. In other words, the covariance estimate is 2.236 standard errors above zero. The probability of getting a critical ratio as large as 2.236 in absolute value is .025. In other words, the covariance between F1 and F3 is significantly different from zero at the 0.05 level (two-tailed). The estimated correlation between F1 and F3 is 216**.**

The table of the variance and squared multiple correlation shows the variance of F1 is estimated to be 1.219. The variance estimate, 1.219, has a standard error of about .181. Dividing the variance estimate by the estimate of its standard error gives z = 1.219/.181 = 6.748. In other words, the variance estimate is 6.748 standard errors above zero. The probability of getting a critical ratio as large as 6.748 in absolute value is less than 0.001. In other words, the variance estimate for F1 is significantly different from zero at the 0.001 level (two-tailed). It is estimated that the predictors of V11 explain 36.2 percent of its variance. In other words, the error variance of V11 is approximately 63.8 percent of the variance of V11 itself. From the variance table it is clear that all the probability values are significant.

TABLE 8. VARIANCES AND SQUARED MULTIPLE CORRELATIONS

Variances Squared Multiple Correlations

	Estimate	S.E.	C.R.	**P**		Estimate
F1	1.219	0.181	6.748	***	V11	0.362
F2	0.668	0.155	4.312	***	V10	0.626
F3	0.413	0.129	3.214	0.001	V8	0.454
F4	0.654	0.145	4.495	***	V7	0.226
F5	0.752	0.145	5.186	***	V9	0.500
e1	0.283	0.103	2.731	.006	V2	0.698
e2	0.832	0.097	8.558	***	V1	0.419
e3	1.232	0.132	9.326	***	V3	0.262
e4	0.980	0.112	8.760	***	V5	0.819
e5	1.033	0.127	8.154	***	V4	0.443
e6	0.932	0.122	7.630	***	V6	0.393
e7	0.343	0.160	2.149	0.032	V14	0.338
e8	1.165	0.137	8.477	***	V15	0.201
e9	0.837	0.129	6.501	***	V13	0.372
e10	0.368	0.139	2.646	0.008	V12	0.812
e11	0.655	0.110	5.928	***		
e12	1.241	0.143	8.696	***		
e14	0.450	0.101	4.467	***		
e15	0.828	0.101	8.159	***		
e13	0.850	0.130	6.544	***		

This study tends to identify the developing system of learning by using mobile internet in Bangladesh on the basis of students' mobile internet usage and process of development. Two dimensions of mobile internet usage are taken into consideration: smart phone and internet, provided by mobile network. *Reading online newspaper* component is *81%* responsible in improving the learning process. On the other hand, *practicing e-book* is 91% correlated to the factor *study anytime anywhere* which is 82% responsible to develop the process. Sufficient internet facility gives 70% developing responsibility. *Look up New Idea in Internet* is 50% liabilities, which has 71% correlation to q*uick feedback*. However, all the correlation and covariance are positive which means if one changes then other components change positively. Again factor four and factor five and also factor one and factor four are highly correlated.

CONCLUSIONS AND RECOMMENDATIONS

Mobile internet has become an integrated part of our daily lives, so it will not be long before it also becomes an inseparable part of students' and teachers' learning and developing. However, the integration of technology in the school curriculum is a complex and challenging process that needs to take into account numerous socio-technical factors such as teachers' technical and technological skills, confidence, and attitude toward ICT,

the use of internet in teaching and learning, technology infrastructure in the school, school environment etc.

The finding of the study shows that the use of mobile internet in a learning system is very effective especially in the secondary and higher secondary level students. The results of this study show that the responses to the questionnaire have a reliability coefficient that is adequately high. In addition, the construct validity evidence is based on a factor analysis that created some easily interpretable factors. However, the results of this study also show that important factors that do play a role in the successful integration of m-internet in schools are those of teachers' actual knowledge and use of various mobile software and apps in educational purposes, teacher confidence and attitudes toward technology, the technology infrastructure and support in the schools, as well as teachers' beliefs about the use of technology as an agent for change. If proper steps are taken by the academic institutions to improve the educational system that will help positively.

Resource of the internet must be sufficient and it is also important to provide effective guidance or instructors for the specific organization, so that the students may get sufficient, proper and accurate information and practice properly. Different types of informative blogs and web sites which contain related information about the learning process or text book based information should be developed. Mobile apps provide a positive perception to improve the learning system so it should introduce and ensure provision of all kinds of resource of mobile internet and also ensure sufficient knowledge based instructors. At the end of the article it may conclude, combination of some important components which are determined in factor analysis may give a positive change to the learning system in Bangladesh.

Some of the recommendations that can be followed in the educational institutions to build an efficient society in Bangladesh:

- ✓ Provide sufficient training for the instructor who is involved in mobile internet related education.
- ✓ Building of easy access facilities and internet availability for all types of learners and also to administrative persons.
- ✓ Available resources should be introduced in all the institutes as well as individually.
- ✓ Basic course on mobile application of internet use should be mandatory.
- ✓ Website of the institution and personal blogs should be compulsory along with regular updates.

REFERENCES

Abu-Al-Aish, A., & Love, S. (2013). Factors influencing students' acceptance of m-learning: An investigation in higher education. *The International Review of Research in Open and Distributed Learning, 14*(5).

Ally, M., & Prieto-Blázquez, J. (2014). What is the future of mobile learning in education? *RUSC. Universities and Knowledge Society Journal, 11*(1), 142-151.

Avgerou, C. (2010). Discourses on ICT and Development. *Information Technologies & International Development, 6*(3), pp. 1-18.

Aypay, A. (2010). Information and Communication Technology (ICT) Usage and Achievement of Turkish Students in Pisa 2006. *Turkish Online Journal of Educational Technology-TOJET, 9*(2), 116-124.

Banks, F., & Chikasanda, V. M. (2015). Technology Education and Developing Countries. In P. J. Williams, A. Jones & C. Buntting (Eds.), *The Future of Technology Education* (pp. 217-238): Springer Singapore.

Begum, R. (2011). Prospect for cell phones as instructional tools in the EFL classroom: A case study of Jahangirnagar University, Bangladesh. *English Language Teaching, 4*(1), p105.

Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education, 58*(2), 843-855.

Bidaki, M. Z., Sanati, A. R., & Ghannad, F. R. (2013). Producing and introducing mobile books, as a new model of providing learning content in medical sciences. *Procedia-Social and Behavioral Sciences, 83*, 99-102.

Cha, S. E., Jun, S. J., Kwon, D. Y., Kim, H. S., Kim, S. B., Kim, J. M., & Jun, W. C. (2011). Measuring achievement of ICT competency for students in Korea. *Computers & Education, 56*(4), 990-1002.

Chen, C.-M., & Chung, C.-J. (2008). Personalized mobile English vocabulary learning system based on item response theory and learning memory cycle. *Computers & Education, 51*(2), 624-645.

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education, 59*(3), 1054-1064.

Chhachhar, A. R., Makhijani, H. B., Khushk, G. M., & Maher, Z. A. (2013). Information and Communication Technologies for Rural Development in Developing countries. *Journal of American Science, 9*(9).

Deb, S. (2011). Effective distance learning in developing countries using mobile and multimedia technology. *International Journal of Multimedia and Ubiquitous Engineering, 6*(2), 33-40.

Dupuy, A., & Nassar, D. (2014). Dichotomization of primary outcomes serves external validity. *The Journal of investigative dermatology, 134*(1), 267.

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education, 19*, 18-26.

Higgins, S. J., & Association, B. E. R. (2003). *Does ICT improve learning and teaching in schools?* : BERA, British Educational Research Association.

Hwang, G.-J., & Chang, H.-F. (2011). A formative assessment-based mobile learning approach to improving the learning attitudes and achievements of students. *Computers & Education, 56*(4), 1023-1031.

Kinash, S., Brand, J., & Mathew, T. (2012). Challenging mobile learning discourse through research: Student perceptions of Blackboard Mobile Learn and iPads. *Australasian journal of educational technology, 28*(4).

Marwan, M., Madar, A., & Fuad, N. (2014). Development of Mobile EEF Learning System (MEEFLS) for Mobile Learning Implementation in Kolej Poly-Tech MARA (KPTM). *Development, 1*, 6183.

Masud, M. A. H., & Huang, X. (2013). M-learning Architecture for Cloud-based Higher Education System of Bangladesh. *Mobile Computing, 2*(4), 84-94.

Norris, M., & Lecavalier, L. (2010). Evaluating the use of exploratory factor analysis in developmental disability psychological research. *Journal of autism and developmental disorders, 40*(1), 8-20.

Nyachwaya, J. M., Mohamed, A.-R., Roehrig, G. H., Wood, N. B., Kern, A. L., & Schneider, J. L. (2011). The development of an open-ended drawing tool: an alternative diagnostic tool for assessing students' understanding of the particulate nature of matter. *Chemistry Education Research and Practice, 12*(2), 121-132.

Page, T. (2014). Application-based mobile devices in design education. *International Journal of Mobile Learning and Organisation, 8*(2), 96-111.

Park, S. Y., Nam, M. W., & Cha, S. B. (2012). University students' behavioral intention to use mobile learning: Evaluating the technology acceptance model. *British Journal of Educational Technology, 43*(4), 592-605.

Rau, P.-L. P., Gao, Q., & Wu, L.-M. (2008). Using mobile communication technology in high school education: Motivation, pressure, and learning performance. *Computers & Education, 50*(1), 1-22.

Tynjälä, P., Häkkinen, P., & Hämäläinen, R. (2014). TEL@ work: Toward integration of theory and practice. *British Journal of Educational Technology, 45*(6), 990-1000.

Valacich, J., & Schneider, C. (2014). Information Systems Today: Managing in the Digital World with MyITLab. *Policy Statement*.

Wastiau, P., Blamire, R., Kearney, C., Quittre, V., Van de Gaer, E., & Monseur, C. (2013). The Use of ICT in Education: a survey of schools in Europe. *European Journal of Education, 48*(1), 11-27.

Wu, P.-H., Hwang, G.-J., Su, L.-H., & Huang, Y.-M. (2012). A Context-Aware Mobile Learning System for Supporting Cognitive Apprenticeships in Nursing Skills Training. *Educational Technology & Society, 15*(1), 223-236.

Zhao, Y. (2013). Recent developments in technology and language learning: A literature review and meta-analysis. *CALICO journal, 21*(1), 7-27.

Zhou, T. (2011). Examining the critical success factors of mobile website adoption. *Online Information Review, 35*(4), 636-652.