Research Article

Role of the Principals in Improving the ICT Based Teaching-Learning Process in the Government Colleges in Bangladesh: A Study of a Government College

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Abstract: The Information and Communication Technology (ICT) Policy 2010, The Education Policy 2015 and the Vision 2021 of Digitized Bangladesh encompass the Envision 2030 of the United Nations' reaching to Sustainable Development Goals focusing exponentially on the urgency of quality education. This paper affords to hint at one of the major characteristic factors among several key factors to reach the goal of quality education by the designated time frame and this includes improvement of teaching–learning process that implies that a teacher as well as learner must ensure quality and this paper tends to highlight on the ICT inclusion in teaching – learning process to reach the goal. The paper has high pointed how a principal can role play in this process. The paper is specified in this sense that it designates the specific type of college of Bangladesh, which has been delved out Government College pertinent to its funding and administrative management shared fully through government authority. As such, it is the matter of interest as well as that of challenge how a principal of this type of specialized college can ensure the ICT based teaching – learning atmosphere in the institutions. The government colleges are almost 600 which is a small part of total colleges of Bangladesh. However, the rate of enrolment is the higher and the standard of education of these colleges are mentionable. As such, the government college and the principal of this college are taken for granted as test case. The role of the principal thus pointed out with dotted points for the effect of intelligibility of way and the responsibilities for materializing ICT–enabled education system.
Keywords: Role, Improve, ICT based Teaching-Learning, Govt. Colleges, Bangladesh.

1. Introduction
The topic of the paper aims at searching several key answers of the used phrases as (i) the improvement of ICT based teaching–learning process, (ii) the improvement hanging around the government colleges of Bangladesh , (iii) the responsibility of the principal for all of the above and the last but not the least, (iv) The study of a specific Government college, for convenience, of Bangladesh in order to dig out how much responsible the principal is for improving ICT enabled teaching – learning in colleges. Gunton (1993) has highlighted with a clear idea of what ICT enabled Teaching–Learning is. According to the researcher it is defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information through institution based educational process. Now, 'why does a college imperatively think for ICT enabled education' has long been discussed and established as such, Ndongfack (2010) has the opinion that '*ICT is*

considered as one of the pillars upon which quality education for all can indeed become a reality' .The traditional approach cannot meet the demand of the students of the 21 century whereas a student can learn what s/he requires online using ICT and such, the limitations of distance have been broken by technology (Kennah, 2016) which is the aspect of modern ICT based education system.

According to Flanagan & Jacobsen (2003), a principal is credited with managing and supervising the institution and this paves the way to transform to the technology manager by supervising and providing ICT resources. Thus, the paper generally chooses the objective of this study to determine the role of the principals for improving ICT based teaching-learning process in college education.

The specific objectives are-
i. to evaluate the necessity of ICT based teaching-learning process
ii. to explore the ways principals can improve ICT based teaching-learning process.

To meet the objectives of the study the following research questions are set.
i. What are the opportunities and weaknesses of existing Teaching-Learning process?
ii. Why is ICT based teaching-learning needed?
iii. Why is the role of Principals important?
iv. How can the Principals improve the ICT based teaching-learning process in education?

A government college has been selected purposively for the case study which is the method for data collection in this qualitative study. Two techniques have been used namely document analysis and interview. Public policies such as Education Policy-2010, ICT Policy-2015, resolutions of Academic Council meetings etc. have been analyzed. The Principal, two teachers, two parents and two students have been interviewed. All that design is to intend for designating the key role of the principal in order to improve institutional efficacy of ICT based Teaching–Learning Process.

2. Literature Review

Many studies on Bangladesh colleges regarding the ICT proficient college infrastructure and the admittance of improving the use of multimedia in teaching (Sarowardy & Halder, 2019), and the technology orientation on the part of the learners (Halder, 2019) have been remarkably completed which tend to foster the idea that the necessity of using ICT (multimedia in alternative terms) is an accepted way of teaching – learning methodology. But the responsibility of the principal of integrating ICT in college education in the case of Bangladesh is rarely traceable that Flanagan and Jacobson (2003) exposes an effective leadership in institution is asked for integrating ICT in the receptive process of teaching – learning .These researchers found principals can undertake new leadership responsibilities in this area.

Similarly, Fullan (2003) admits that leadership is crucial to large scale sustainable reform and that leadership represents the strategy of the 21st century. The role of the principals is changing and leadership is always about addressing issues of change (Macneill *et al.,* 2005). It is distinctively visible site that the colleges of Bangladesh are showing the prone to multimedia methodical education and the previous ideation of Fullan (2003) and Macneill et al (2005) conveyed the leadership quality of the principal required for ICT integration. But the principal must have distinct logic for attainable mission why he/she will embrace the challenges. Khanam *et al.,* (2013) has provided with the answer to that confusion stating that

the Government of Bangladesh has adopted ICT Policy 2010 'aiming to turn the huge number of its potential young intelligent populace into a resourceful one' and the principals of the colleges of Bangladesh can never deny it.

Now, the point is how a principal can integrate this method into process. Earle (2002) studies that curriculum is the only vehicle for durable effect that a principal must focus on. In this regard, Spillane (2005) found that this leader creates new organizational routines and structures it with time to transform the institution's culture, contributing in turn to greater teacher satisfaction, higher teacher expectations for students, and improved student achievement and this leader attains this transformation by applying the strategies including regular ICT discussion, workshops, one-on-one practice session, peer tutoring, team teaching, seeking assistance from friends and colleagues who are more computer-literate and appointment of ICT experts in the institution (Schiller, 2002). The literature dealt above duly stated why and how a principal should focus on the improvement of ICT enabled teaching–learning in the colleges. But the implementation is beset with several pivotal challenging factors as Flagnan and Jacobsen (2003) admitted that the principal are required to provide leadership in areas they are unfamiliar because:

Many principals have not been prepared for their new role as technology leaders, and have therefore struggled to develop both the human and technical resources necessary to achieve ICT outcomes in their schools. Very few principals have themselves used computers in meaningful ways with children, and therefore lack the requisite pedagogical vision and experience to guide teachers. (p. 127)

This literature reviews conclude with the vindication that the integration and improvement of ICT in education largely depends upon the leadership role and in case of college education it is the principal who are credited to take the responsibility though a principal has to face various internal challenges, emerging from himself/herself as well as external one forges by the college staff, administrational factors etc. which need to be duly addressed to gift an ICT enabled college.

3. Methodology
3.1 Case study
This assignment aims at evaluating the role of the principals in using ICT based teaching-learning process in the college education of Bangladesh. A qualitative methodology is used here. As it is a qualitative case study of a government college, data was gathered mainly through document analysis supported by interview. Tewksbury (2009) has opinion that qualitative study can provide details about human behavior, attitude, belief, emotion and personality characteristic. Qualitative research values the experience of the research participants and can offer valuable insight into the settings and situations (p.44). Again, qualitative study is worthy for this study as 'qualitative research is a multi-method in focus, involving an interpretive, naturalistic approach to its subject matter (Denzin and Lincoln, 1994). Again, qualitative research approach holistically understands the human experience in specific settings (Denzin and Lincoln, 2002).

Moreover, qualitative research design has a flexible structure as the design can be constructed and reconstructed to a greater extent (Maxwell, 2012). Thus, the thorough and appropriate analyses of an issue can be produced by utilizing qualitative research method, and therefore the participants have sufficient freedom to determine what is consistent for them (Flick, 2011).

3.2 Document Analysis

This paper also tends to analyze different kinds of documents related to the ICT based teaching-learning process of Bangladesh. The present research has mainly analyzed "The National Information and Communication Technology (ICT) Policy-2015" of the government of Bangladesh, "The National Education Policy-2010" of the Government of Bangladesh and different rules, regulations, acts, circulars etc. Besides, Resolutions of Academic Council and Staff Councils of the college are also important part which works as guideline to run the college. Because this approach is particularly useful when the researchers are faced with the task of analyzing a variety of documents which have no common format and which appear to be developed without sufficient empirical evidence (Appleton and Cowley, 1997). Documentary evidence can provide a researcher with a wealth of rich and detailed information which is unbiased (Appleton and Cowley, 1997).

3.3 Interview

In this study, one principal, two teachers, two students and two guardians- total seven interviewees, were interviewed. This one-to-one semi-structured interviews were the primary source of data for this research. Interview technique has been purposively selected because Berg (2007) has contended that it not only (i) builds a holistic snapshot, (ii) analyses words and (iv) reports detailed views of information but it enables interviewees to speak in their own voice and express their own thoughts and feelings which is necessary to keep the research data authenticated.

4. Findings

This part comprises the findings of the study. The data was collected through the case study of a government college of Bangladesh; observation method was used, through interviews, and document analysis. This part aims to demonstrate the real scenario found in the college with regard to the role of principal in using ICT based teaching-learning in the government colleges of Bangladesh and how to improve it.

4.1 Documents

The Government of Bangladesh has given emphasis to the inclusion of ICT in the education system. For this purpose, different policies have been developed and are being implemented to integrate ICT in the education system. Here key elements in the National Information and Communication Technology Policy-2015, and the National Education Policy-2010 are analyzed for the purpose of delve upon information.

4.1.1 The National Information and Communication Technology (ICT) Policy-2015

The National Information and Communication Technology (ICT) Policy-2015 of Bangladesh considers ICT as an essential means for the country's economic and social development (Ministry of Science and Information and Communication Technology of Bangladesh, 2015). The policy defines ICT as any kind of electronic technology that supports the creating, preserving, processing, transforming and disseminating of information. This policy addresses all public sectors of Bangladesh, such as business, social-welfare, and education, and it recommends strategies for integrating ICT into each sector. In regard to the education sector, this policy aims to develop citizens' computer literacy, and encourage research and development work in ICT. It advocates ICT courses in different education programs.

Bangladesh's national ICT policy considers ICT as a fundamental skill of the 21st century, and suggests different strategies to develop ICT literacy for primary and secondary teachers and students. For this purpose, the policy recommends developing the ICT infrastructure in

educational institutions through the provision of computers, local area networks and Internet connections. The policy has ten specific goals. The fourth objective titled "Education and Research" states "Expand the reach and quality of education to all parts of the country using ICTs, ensure computer literacy at all levels of education and public service and facilitate innovation, creation of intellectual property and adoption of ICTs through appropriate research and development." The policy also regards ICT as an effective tool for teaching and learning activities, and mandated the preparation of multimedia-based content and materials for the teacher training programs.

In order to encourage teachers and teacher educators to use ICT in classrooms, the policy advises providing them with ICT loans and incentives so that they can buy ICT equipment and prepare resources for multimedia based classroom environments. It also recommends preparing teachers to use ICT in classrooms.

With a view to integrating ICT in education, the ICT policy suggests preparing digital learning content, such as e-books, in Bengali scripts and disseminating those in schools. The national ICT policy aims to introduce ICT-related subjects at all levels of education, and to progressively upgrade the curriculum. It also proposes to set up a central online database of digitally developed learning materials, e-books and lesson-plans so that teachers as well as students can gain easy access to resources and find essential information. The policy further recommends recruiting teachers in schools who have considerable ICT knowledge and skills. In addition, the policy advocates the preparation of appropriate learning materials to support the education of children with special needs.

4.1.2 The National Education Policy-2010
The National Education Policy-2010 also emphasizes the integration of ICT in the education system suggesting that ICT is one of the most important elements to lever the quality of education (Ministry of Education of Bangladesh, 2010). The first chapter of the policy (the Goals and Objectives of Education) consists of 30 general objectives of education in Bangladesh and the twenty-first objective is "to increase the use of information and communication technology as a teaching-learning tool in all levels of education" (p. 2). Accordingly, in chapter four, 'Secondary Education', the policy proposes to introduce ICT as a compulsory subject in the secondary curriculum, and recommends that the Government provide the necessary ICT infrastructure in schools. In order to prepare the teachers for teaching with and about ICT, in Chapter 24 'Teacher Training', it proposes to modernize the teacher education curriculum and syllabus with ICT knowledge and skills.

Moreover, there is a separate chapter on ICT education. Chapter 12, "Information Technology Education", states that ICT education can contribute to reducing the poverty of the country by preparing the pupils with effective skills to work abroad in ICT sectors and consequently to send remittance back to Bangladesh. It states two specific objectives of ICT education: firstly, preparation of international standard ICT-experts, and secondly, the prioritization of knowledge pertaining to not only computer science, but also a wide range of communication technologies, such as mobile and telecommunication technologies, radio, and television.

In order to introduce ICT to children, the policy recommends including ICT as a teaching-learning tool within educational institutions, and it proposes the inclusion of 'computer science' as a subject in the secondary curriculum for those students who want to further their study of ICT within the science discipline.

4.1.3 Resolutions of Academic Council and Staff Council of the studied college
Resolutions of Academic Council and Staff Council show that the college authority has given importance on the use of ICT. They recognize the role of the principal to improve ICT based teaching-learning process. One of the resolutions reads:
"The principal will take initiative to make ICT based infrastructure. He will make arrangement for in-house training for the teachers."

4.2 Interview
4.2.1 Importance of the role of the principals
When the interviewees were asked if they thought that the role of the Principals is important for the development of college education, all of them affirmatively answered. When they were asked why they thought so, most of them answered that the Principal is the head of the college. He can take any decision. So, improvement of ICT in education basically depends on his decision. One of them, the principal, commented, "The Principal plays the vital role in taking decision. So, the issue of using ICT also depends on himself". One of the teachers opines, "As the Principal is the chief administrator, he plays the most important role in developing education. The question of using ICT is hence dependent on him."

One of the parents stated:
"The development of a college- its educational atmosphere, attitudes of teachers towards the students, the standard of education etc.- all depends on the Principal."

One of the students emphasized the importance of the role of the Principal. She explained:
"The Principal is the controller of the college. He can have a very positive role for the improvement of the college. Again he can take any initiative to make the teaching-learning process beneficial for the students. He can build a good relation with the students; share the ideas with the students. In this way his role is very important."

Another student of master's degree emphasized on the role of the principal in running a college.
She explained:
"The Principal can introduce different systems to run the college. He can take advantage of modern technology to modernize the teaching-learning process. He can make the teacher use the modern equipments in teaching. Moreover, he can make the teachers and students aware of the different modern process of teaching and learning."

A guardian said that the role of the principal in the college is most important. He commented:
"A Principal can take different initiatives to upgrade the education system. All the activities of the college are controlled by him. Again, students are bound to him. So his desire to change the environment is enough."

A teacher talked about the role of the Principal as technological leader. He said:
"A Principal plays a great role to develop the educational environment here in this college. He can take a lot of initiatives such as setting up wifi zone, multi-media class room etc. so that the students and teachers can take full benefit of ICT."

The teacher also commented:
"You cannot change anything in the college keeping the Principal out of the process. The Principal controls everything. He can take initiative to make ICT based teaching learning process."

4.2.2 The influence of ICT on teaching-learning process

When the interviewees were asked if they think ICT influences teaching learning method. All of them said that ICT plays a great role in the digitalization to the teaching learning process. One teacher highlighted that ICT tools help him both in getting diverse materials in his subject and interest of the students:

"If I use internet I find much more information that is not available in the textbooks. I can prepare my lessons using my computer using ICT"

He continued to say:

"Though the scope is limited, sometimes I use digital content in my class. I realize that there are significant changes in my teaching and also the students. Actually using ICT in teaching learning the teacher and the student come closer and they both can participate in the learning process. It makes the teaching-learning process learner centered."

Another teacher found using ICT in teaching-learning much practical:

"ICT makes teaching-learning process practical. Using ICT tools can make students learn it more quickly and can remember them for a long period of time. The relationship between the teacher and the student becomes more developed. More importantly, quality of education is ensured through the use of ICT."

One guardian remarked that through ICT the education methods of other countries can be known to develop to the system:

"Using ICT we can know how teaching-learning process is getting changed in the word and use that knowledge to develop for own system. Without the knowledge of ICT, the modern education system is inactive."

Another guardian also emphasized on the use of ICT to keep pace with the modern word:

"There is a great change throughout the word using ICT. The teaching-learning process is also developed using it. So if we cannot use ICT in teaching-learning, we cannot be developed. It helps us keep pace with the modern education system."

One of students highlighted that using ICT improves the merit of the students. At the same time teachers can develop themselves with the use of ICT. Another student mentioned the power of use of ICT to increase the understanding level of the students:

"If classes are conducted using multimedia, the subjects that are difficult become easy and the students can understand them properly. We can learn things well when we can visualize them. Actually the quality of education changes by using ICT."

The principal stated:

"ICT can help to get the updated information related to education. Again we can get information easily. If we use ICT tools in the class, the students will be attracted as they will be able to learn easily."

4.2.3 Opportunities and weaknesses of the existing teaching-learning process

Every respondent marked some opportunities and weaknesses of the existing education system of colleges.

The principal mentioned that use of ICT has been started but there is lack of complete ICT based infrastructure:

"We can get information by using internet. There is official use of internet. But the class rooms are not fully equipped with multimedia facilities. Again, the teachers are qualified here but all of them are not properly trained in using ICT. All of them do not know how to prepare digital content and conduct classes with multi-media."

One of the teachers emphasized on the quality of the teachers.
"The quality of the teachers is important. Most of them faced Bangladesh civil service examination. They will be able to adapt to any situation. If proper training is given to them, they will become ICT adaptable resource. But the problem is with the examination system and the continuous change in syllabus."

Another teacher mentioned about the students' interest in ICT:
"It is very positive that our students are coming interested in ICT. They face enthusiastic regarding multimedia class room. But in this way the hindrance is that there is a large amount of students in a class. Again there is lack of digitally equipped class room. Moreover there is lack of training of the teachers."

One of the students remarked:
"Through the use of ICT we can gain knowledge directly. We can learn with amusement. But, there is lack of skilled teachers and digital class-rooms."

One of the parents remarked:
"The present government has given utmost importance to ICT education but proper infrastructure has not been developed yet. My daughter says that the teachers are very qualified but they mainly follow the traditional lecture method."

4.2.4 Role of principals to improve ICT based teaching-learning process
When the interviewees were asked if they think that the principal can improve ICT based teaching-learning process in college, everyone responded positively. And they mentioned different ways how the principal can integrate ICT in the college to improve ICT based teaching-learning process. The principal mentioned the role of himself to use resource to improve ICT in the college.
He stated:
"It is the principal who can use the resource. He can persuade the government bodies to make arrangements for the improvement of the ICT infrastructure. Again, he can arrange internal trainings and workshops for the teachers and the students on the use of ICT in education. If that is done they will be able to improve ICT based teaching-learning themselves."

One of the teachers stated:
"A principal has limitation of resource. As a government service holder, he cannot spend money without the permission of the higher authority. However, he can uphold the importance of ICT to the higher authority. He can communicate to the authority so that they train the teachers and provide the necessary ICT infrastructure."

Many of the interviewees gave importance on the multimedia class-rooms. One of the teachers remarked:
"The principal can arrange sufficient multimedia classrooms for the improvement of ICT. Again, in-house training programmes can be arranged for the teachers. This will train the teachers to use ICT properly."

One of the students said:
"The principal can buy ICT tools for the college."

One of the parents said:
"The principal can make the learning of ICT mandatory for the students and teachers. He can introduce a short term course on ICT. This will introduce the students and the teachers with ICT. In this way a principal alone can bring a revolutionary change in the field of ICT."

Parents are very eager to meet the teachers. Three councils of the parents revealed that they want the teachers use ICT based tools in the process. One Guardian said, "We want that you use different digital methods in the college. For example, you can use biometric attendance system which will make us aware of the presence of our wards."

From this section, it could be realized that the principal has a great role to run a college. Actually, a principal is in the center to improve ICT in teaching-learning process. All the interviewees emphasized the role of the principal in college.

5. Results
5.1 Role of the Principal
The Principals act as the head of the colleges of Bangladesh. It is the role of the principals to make sure the process of teaching-learning in college education of Bangladesh. There could be remarkable change if the Principals could actively introduce ICT based teaching-learning. As the leader of the institution it is expected that the Principals would be able to turn their traditional manpower into ICT skilled manpower. Principals who are visionary and inspirational can develop the same qualities in others (Gurr, Drysdale and Mulford, 2006). Again, the traditional infrastructure of teaching-learning is to be turned into digital ICT based infrastructure. Institution leaders collaboratively formulated plans for a better implementation of a technological vision in their institutions. They wanted to prepare technology and information dependent students and skilled manpower to reach the Vision 2021 of the Bangladesh government. Morshed (2016) is of the opinion that it is the Principals who are the media through whom the Government implements its objectives in the college education sector. It is the principal who ensures the teaching-learning environment. All interviewees recognized the leadership role of the principal. Leadership is accountable for how well teachers teach and how much students learn.

5.2 The role of the Principals in developing ICT-Focused classroom
It is found from the study that the class rooms are not digital enough to meet the need of the students. The class rooms act as a barrier to the way of using ICT based teaching-learning. There is a bureaucratic hindrance in the way of making digital class rooms. The Principal is responsible for the running of the college but he has to look forward to the government to meet the needs of the college. Students are not getting the full benefit of the ICT based teaching-learning process. It is understood here that the use of ICT tools would make them more attractive in the classes. They would be able to be linked with the world of internet-based learning process. This would certainly broaden the scope of learning. It is evident from the findings that the teachers have less access to use ICT based tools. Principals, who recognise this, know it can make the school more efficient and transformative (Haughey, 2006).

The result of the present study found that the classrooms are not fully equipped with multimedia and other instruments. There are some microphones, projectors etc. but the

traditional use of board and marker is the main method to teach in the class rooms. Again, the few multimedia instruments are not used properly. Here it is found that the Principal cannot act fully without the prior permission of the higher authority as it is government body. He actually acts as the bridge between the government and the college. It is understood that the Principal has been trying utmost to make total digitalization of the class rooms but financial crisis is a constraint here.

The result of this study showed that the many of the students are well aware of the modern equipment of teaching-learning. They do not understand their use but they think that if they are used in the classrooms it would be much beneficial for them. While observing the classes it is found that when projectors are used the students become more interested.

It is found that the teachers cannot always use ICT in the classrooms because of the lack of digitalization of class rooms. Interviewees accepted that many teachers are well aware of the ICT based tools in teaching-learning. But, they reiterated that there is limited access for the teachers to use them as the class rooms are not digital.

5.3 Opportunities and weaknesses of the exiting education system
For improving a system the first thing which needs to be done is finding out the opportunities and weaknesses of the existing system. The present study found that the existing system of teaching-learning is a blending one. It has discovered that there is the use of both the traditional and ICT based methods. Findings suggest that there are some opportunities and weaknesses of the existing system. Actually it is found that at present a blending system is used.

The interviewees stated that there are a few rooms where multi-media instruments are used. Again, they admitted the teachers have limitation of ICT knowledge because of lack of training. The use of ICT is very limited as there are some constraints such as lack of infrastructure, lack of ICT skilled manpower, lack of willingness etc. Again, there are some opportunities as well, such as, (i) support from the government for ICT based teaching-learning system, (ii) qualified teachers and (iii) interested students etc.

It is found that the teachers are highly-educated. It is revealed that they have good educational background. Again, they are much willing to use the ICT tools in imparting the classes. Moreover, they are very much professional. However, there is some lack of adequate knowledge and skill in ICT.

The Education Policy of Bangladesh clearly stated the urge of an ICT based teaching-learning system. There is some use of ICT in the classrooms. Teachers and students are aware of the fact that in the modern world it is very urgent to use ICT in the classrooms. The present system is a teacher oriented system. Here the teachers remain in the focus. Mainly lecture method is used. Students do not have much opportunity to discuss with teacher and to give their own opinion etc. Again the teachers also feel the urge of communicating with the students through technology but they do no find that scope.

5.4 Role of the principal to improve ICT in teaching-learning process
The findings show that teachers need training in ICT as they have limited knowledge in ICT and its use in education. Finger et al. (2007) review different research studies and policy documents from different countries and note that the integration of ICT in education is often conceptualized as three staged process: acquiring ICT skills, enhancing learning and teaching

with ICT and transforming pedagogy, content and structure of schooling with ICT. Almost all interviewees opined that the principal can arrange in-house trainings and workshops so that the teachers become capable of using ICT in class rooms. In this regard, Flanagan and Jacobsen (2003) found that to improve education, principals must adapt their management and leadership styles to motivate teachers to use ICT in their professional curriculum practices. To improve ICT based teaching-learning, principals must act as coordinator to provide training to the teachers. The interviewees emphasized that the principal should communicate with the higher authority so that they arrange training for the teachers. Studies reveal that the principal can manage ICT tools in the classrooms.

6. Conclusion and recommendations
6.1 Conclusion
This study tries to examine the role of the Principals in improving ICT based teaching-learning process in the government colleges of Bangladesh. The Principals act as the head of the colleges of Bangladesh. The success of an institution depends on the principal's ability to effectively lead and develop change, to the creation of a learning community (Collarbone, 2003).

The Government of Bangladesh looks forward to improving the standard of education by using ICT to cope with the demand of the 21st century. Its vision regarding education is expressed through the Education Policy-2010 and Vision 2021. It is evident from the earlier chapters that the role of the Principals is very significant in improving ICT based teaching-learning process. A Principal manages a college. He implements the policy of the government in college. The effective leadership of principal can create a learning community by developing a culture that supports and caters to risk taking, innovation and adaptation to change (Gurr, Drysdale and Mulford, 2006). Again, he upholds the prospects and the problems of the college to the government. So, according to the finding of the study it could be said that the Principals are the center from where the improvement of the ICT based teaching-learning starts. The principal needs to understand that ICT is an essential component in engaging students in learning, it is through the promotion of teachers' ICT use that effective pedagogy can be realised (Bishop, 2002).

6.2 Recommendation
The study focuses some recommendations.
They are-
✓ Full ICT based enrolment and registering system is required.
✓ Classrooms should be digitalized with using smart board.
✓ E-attendance should be introduced.
✓ Teachers must be trained in ICT based teaching-learning process.
✓ Principals must be trained in and aware of ICT based teaching-learning
✓ Study should be carried out on the level of knowledge of the teachers.
✓ Outcome of ICT based teaching-learning process should be evaluated.
✓ Further study should be carried on obstacles on the way to use ICT based teaching learning process.

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