Journal of Research in Instructional
e-ISSN: 2776-222X
Vol. 2(2) 2022, pp. 175 – 196

Multimedia classrooms of the secondary schools in Bangladesh: A situation analysis

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Abstract: As the multimedia classroom gained enormous importance from the government of Bangladesh to modernize the educational system, this study initiated the objective to investigate the state of those classrooms at secondary schools. The study used a mixed-method approach with qualitative and quantitative data to explore the execution and possible improvements for those multimedia classes. Five secondary schools were selected purposively from each of the two districts named Sylhet and Cumilla. From these ten schools, hundred students and hundred assistant teachers were selected randomly to conduct ten focus group discussions (FGD) with each of the two groups. Moreover, ten interviews were conducted with the head teachers. Besides those, classrooms were observed while the multimedia was in use, along with a case study in a school. Although head teachers and assistant teachers mentioned many classes using multimedia, the students' words and observed class information gave alternative facts. Almost similar types of outcomes were found regarding digital content development, monitoring, and mentoring activities. While teachers were optimistic about the quality of digital content and classroom teaching, researchers found those to be less standard. In terms of monitoring the multimedia classroom, the majority of head teachers were more concerned about the number of multimedia used in the classroom due to administrative obligations than the quality.

Keywords: Multimedia class, ICT in education, digital content, secondary school

Ruang kelas multimedia sekolah menengah di Bangladesh: Sebuah analisis situasi

Abstrak: Karena ruang kelas multimedia menjadi sangat penting dari pemerintah Bangladesh untuk memodernisasi sistem pendidikan, penelitian ini memulai tujuan untuk menyelidiki keadaan ruang kelas tersebut di sekolah menengah. Penelitian ini menggunakan pendekatan metode campuran dengan data kualitatif dan kuantitatif untuk mengeksplorasi eksekusi dan kemungkinan perbaikan untuk kelas multimedia tersebut. Lima sekolah menengah dipilih secara purposive dari masing-masing dua distrik bernama Sylhet dan Cumilla. Dari sepuluh sekolah tersebut, dipilih seratus siswa, dan seratus asisten guru secara acak untuk melakukan sepuluh *focus group discussion* (FGD) dengan masing-masing dua kelompok. Selain itu, sepuluh wawancara dilakukan dengan kepala sekolah. Selain itu, ruang kelas diamati saat multimedia digunakan, serta studi kasus di sekolah. Meskipun kepala sekolah dan asisten guru menyebutkan banyak kelas menggunakan multimedia, kata-kata siswa dan informasi kelas yang diamati memberikan fakta alternatif. Jenis hasil yang hampir serupa ditemukan terkait pengembangan konten digital; kegiatan pemantauan, dan pendampingan. Sementara para guru optimis tentang kualitas konten digital dan pengajaran di kelas, para peneliti menemukan bahwa itu kurang standar. Dalam hal pemantauan multimedia kelas, sebagian besar kepala sekolah lebih memperhatikan kuantitas multimedia yang digunakan di kelas karena kewajiban administratif daripada kualitasnya.

Kata Kunci: Kelas multimedia, TIK dalam pendidikan, konten digital, sekolah menengah

Received: 31-10-2022
Accepted: 18-11-2022

To cite this article: Ropum, S. M. K., Islam, M. M., & Rabbi, M. F. (2022). Multimedia classrooms of the secondary schools in Bangladesh: A situation analysis. *Journal of Research in Instructional*, *2*(2), 175–196. https://doi.org/10.30862/jri.v2i2.98

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INTRODUCTION

In the present fast-moving world, information and communication technology (ICT) makes dynamic changes in society. It influences all aspects of life. The influences are felt more and more in education. ICT provides more opportunities to both teachers and students for their teaching and learning (Aladesusi & Akindiya, 2021; Jinnah et al., 2011; Mikre, 2011). ICT is creating opportunities and scope in poor and developing countries (Aziz, 2020). ICT aids in enhancing educational quality by giving all users equitable access to resources (Damopolii et al., 2022; Gürses et al., 2015; Saravanakumar, 2018; Sharma, 2021). However, contemporary constructivist educational theory emphasizes problem-solving, critical thinking, authentic learning experiences, literacy, communication skill, and collaboration – pedagogical practices that transform the teacher's role from information disseminator to learning facilitator, assisting students in actively engaging with information and materials to construct their own understandings. Thus, students learn not just what to study, but also how to learn (Achor & Ngbea, 2022; Lowenthal & Muth, 2008; Vargas-Hernández & Vargas-González, 2022).

The Bangladesh government acknowledges that the conventional teaching-learning approach is teacher-centered and offers students limited opportunity to participate in the learning process (Prime Minister's Office, 2013). For smooth operation of the multimedia classrooms, teachers receive 12-days of training, in which they learn to develop and present digital content for their classrooms and use materials found on the internet under the 'Teacher-led Digital Content Development' initiative, a part of the multimedia classrooms model. In addition to textbooks, teachers can use those contents in multimedia classrooms to explain students' difficult concepts with the help of text, images and animations on presentation slides.

According to the multimedia classrooms model, teachers are supposed to use multimedia facilities while conducting lessons. In addition, teachers need to develop digital content on hard-to-grasp concepts so that students' learning can be sustainable and an enjoyable learning environment can be created. The study has emerged from this point of view, whether the multimedia classrooms model is functioning smoothly.

METHOD

The study followed a mixed-method research approach for this study. This study employed an exploratory sequential mixed-method approach to collect and analyze data.

The researcher collected qualitative data from the head teachers, assistant teachers, and students through Interviews and FGD. The researcher also collected quantitative data by classroom and teacher own developed digital content. By analyzing these qualitative data and quantitative data, the researcher figured out the real scenario of Multimedia Classrooms at the Secondary Level in Bangladesh.

All the teachers and secondary schools with multimedia classrooms are the population of the study. From the populations, a total of 10 secondary schools from two districts were selected for this study as a sample. After that, 10 assistant teachers and 1 head teacher from each of the 10 selected schools were chosen. Moreover, 10 students, 2 from each grade were selected from each of the selected schools. The number of classes for observation was based on the use of multimedia in the classroom; the number can be 0-10

classes. As much as the classes are conducted with multimedia use, as many classes will be observed. Thus, the total number of samples as the individual was 210.

This study employed multiple sampling techniques at different stages. A purposeful sampling technique was used for selecting districts. After selecting the districts, schools were selected considering the availability of 10 teachers. For selecting the teachers and students, simple random sampling technique were used according to their presence in that day. In addition, a convenience sampling technique will be used for observing multimedia classes. An overview of the sample and sampling technique has been given Tabel 1.

Table 1. Overview of sample and sampling technique

S/N	Sample	Sample Size	Sampling Technique
01	School	10 (5 from 2 districts)	Purposive
02	Assistant Teacher	100 (10 from each of 10 schools)	Simple Random
03	Head Teacher	10 (1 from each of 10 schools)	Purposive
04	Students	100 (10 from each of 10 schools)	Simple Random
05	Classes	0-10 (Based on the use of multimedia)	Convenience

Mainly, 3 data collection method was used in this study. These are: Focus Group Discussion (FGD), interview and observation. Data from the assistant teachers and the students were gathered through FGD. In each school, there will be 2 FGD sessions, one with the assistant teachers and the other with the students. Each of the head teachers will go through an interview. Moreover, observation will be used for gathering data from multimedia classes. In addition, researchers conducted a case study in a school since it was not planned previously. Researchers got chance to spend two weeks in a school, then they decided to include this case study under this research.

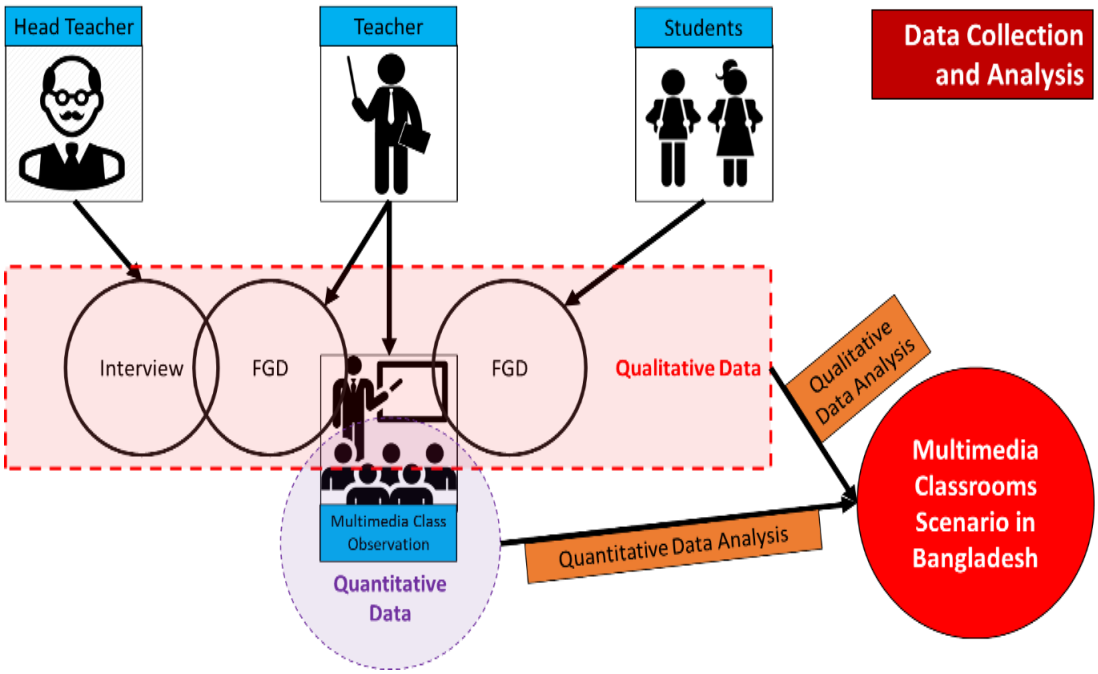

Figure 1. Framework of the study

Three data collection tools will be employed in this study. FGD guideline will be developed and used for conducting FGD sessions. On the other hand, for interview and observation, interview schedule and classroom observation checklist will be used respectively. The Table 2 shows the participants, data collection methods and the related tools.

Table 2. Overview of respondents, data collection techniques and tools

S/N	Respondents	Data Collection Techniques	Data Collection Tools
02	Assistant Teacher	FGD	FGD Guideline
03	Head Teacher	Interview	Interview Schedule
04	Students	FGD	FGD Guideline
05	Multimedia Classes	Observation	Observation Checklist

The quantitative data of the study will be analyzed through descriptive data analysis approach. All of the qualitative data will be divided first into some identical categories or themes through giving codes. After that, the opinions and views will be classified according to the identified themes. The quantitative data analysis will include frequency distribution and average. The popular computer software SPSS and MS Excel software will be used for analyzing the quantitative data.

In the report, all the data will take place under different pre-determined themes. The qualitative data will be major under each theme. Moreover, quantitative data will be used to support the qualitative part of the study so that qualitative part can be stronger and logical. The qualitative data will be presented through tables, charts, and graphs.

RESULTS

As a result of the study's mixed-methods design, the researcher examined and presented the results via a few themes derived from both qualitative and quantitative data. Firstly, data from teachers, head teachers and students were categorized in two major themes to address the study objectives. The first theme is related to status of the multimedia classes and the second theme is related to the status of the multimedia contents prepared by the teachers. Each theme has some sub themes and data were analyzed and presented under these sub themes. Under the first there “status of the multimedia classes”, there are eight (8) sub-themes – frequency of multimedia classes, standard of multimedia classes, teacher’s skill of delivering multimedia classes, teacher’s attitude of conducting multimedia classes, quality of digital contents used in multimedia classes, monitoring and mentoring status of multimedia classes, infrastructural status of multimedia classes, and peer support for conducting multimedia classes. On the other hand, under the second theme “status of digital contents prepared by the teachers” has six (6) sub themes which are volume of digital contents developed by teachers, types of digital contents, relevancy of digital contents with textbook, scopes for students’ engagement in the digital contents, technological standard of the digital contents, duration of the digital contents. Theme based data analysis and major findings are presented below.

Status of the multimedia classes

To present the status of the multimedia classes, data was analyzed in eight (8) sub themes and presented below.

Frequency of multimedia classes

Based on data in Table 3, it is seen that mostly head teachers mentioned higher number of multimedia classes whereas students mentioned a smaller number of multimedia classes happened weekly.

Table 3. Frequency of multimedia classes

Respondent	Weekly 21 % Above	Weekly 16-20	Weekly 11-15	Weekly 6-10	Weekly 1-5
Head Teacher	20%	40%	40%	0%	0%
Assistant Teacher	18%	31%	27%	14%	10%
Student	11%	32%	30%	12%	15%

For instance, one of the respondent head teachers told during interview.

> *"I am not satisfied with the number of multimedia class. Due to lack of projector, laptop and fixed multimedia classes, I could not arrange proper multimedia classes."* [$InHT_{01}$].

Interestingly, one of the respondent students mentioned during FGD that.

> *"Multimedia classes help us to understand herder topic easily.* [$StFGD_{05}St_{02}$].

It was requested by researchers to all 10 schools to run multimedia class if possible. But during visit (data collection), only 6 schools ran multimedia classes, where other schools requested researcher to observe multimedia classes later in other days.

The factors behind the good number of multimedia classes were having fixed multimedia classrooms and good monitoring by head teachers for daily classes. On the other hand, factors behind irregular multimedia classes were just opposite – having no fixed multimedia classrooms in the school, lack of motivation and poor monitoring.

Standard of multimedia classes

Based on data in Table 4, it is seen that mostly head teachers and teachers mentioned average standard whereas students mentioned about standard of multimedia classes as good.

Table 4. Standard of multimedia classes

Respondent	Excellent	Good	Average	Poor	Very Poor
Head Teacher	20%	20%	60%	0%	0%
Assistant Teacher	33%	25%	42%	0%	0%
Student	14%	50%	29%	7%	0%

For instance, one of the respondent head teachers told during interview.

> *"Satisfactory. Teachers are trying to make these multimedia class attractive and lively"* [$InHT_{07}$].

Interestingly, one of the respondent students mentioned during FGD that,

> *"Some multimedia classes have impact on my studies but most of the multimedia classes cannot help me on studies."* [$StFGD_{02}St_{05}$].

One of the respondent students mentioned during FGD that,

> *"Digital contents help us to understand topic partially because a lot of topic could not covered in holistic way by digital contents. Some contents need not presented by digital ways."* [$StFGD_{03}St_{09}$].

Researchers observed 6 classes from those 6 schools and researcher found 3 schools had at least one fixed multimedia classroom & they were in average standard. Researchers identified some key factors behind maintaining the standards for multimedia classroom. These are:

a) Good infrastructure, skilled teachers & strong monitoring for excellent standards for multimedia class.
b) Lack of Infrastructures, poor monitoring & too much class for Average standard.

Teachers' skills of using multimedia classes

Based on the data of Table 5, it is seen that mostly head teachers and students mentioned that teachers were skilled at using multimedia class whereas teachers mentioned highly skilled about this regard.

Table 5. Teachers' skills of using multimedia classes

Respondent	Highly skilled	Skilled	Not skilled
Head Teacher	30%	60%	10%
Assistant Teacher	46%	45%	9%
Student	22%	57%	21%

For instance, one of the respondent teachers told during interview.

> *"Satisfactory. Teachers' skills are decreasing due to not taking the class regularly"* [$AtFGD_{02}At_{06}$].

Interestingly, one of the respondent students mentioned during FGD that.

> *"Setting up for multimedia class is the most challenging part for teachers to operate."* [$StFGD_{07}St_{05}$].

Researchers observed 6 classes from those 6 schools and researcher found 2 teachers were highly skilled and 4 teachers were Average skilled.

Researchers identified some key factors behind teachers' skills for using multimedia classroom. These are:

a) Effect of training & regular practice for highly skilled teachers and

b) Irregular practice, work load & imbalance in getting trainings are the reasons for less skilled teachers.

Teachers attitude using multimedia classes

Table 6 shows that most of the head teachers, teachers, and students mentioned that teachers were positive about using multimedia.

Table 6. Teacher's attitude using multimedia classes

Respondent	Highly positive	Positive	Average	Less Positive	Not Positive
Head Teacher	0%	80%	20%	0%	0%
Assistant Teacher	20%	53%	17%	10%	0%
Student	15%	46%	28%	11%	0%

For instance, one of the respondent head teachers told during interview.

> *"Satisfactory but Teachers need to be more positive and skilled about multimedia class."* [$InHT_{06}$]

Interestingly, one of the respondent assistant teachers mentioned during FGD that.

> *"Teachers are very less positive about multimedia class. Due to workload and proxy classes, they get less time for preparation for multimedia class."* [$ATFGD_{09}At_{05}$]

By observing the teachers' FGD, researcher found most of the teachers were positive. Others express some difficulty of using multimedia classrooms but none were negative.

Researchers identified some key factors behind teachers' attitude using Multimedia Classes. These are:

a) Effect of training & realization of time demand.
b) Very irregular practice & lack of motivation &lack of skills are the reasons for less positive teachers.

Quality of contents of multimedia classes

Based on Table 7, it is seen that the same number of the head teachers mentioned excellent, good and average on quality of contents of Multimedia classes. So, head teachers were not entirely sure about the quality. But most of the teachers and students said average on this regard.

Table 7. Quality of contents of multimedia classes

Respondent	Excellent	Good	Average	Poor	Very Poor
Head Teacher	30%	30%	30%	10%	0%
Assistant Teacher	23%	25%	47%	5%	0%
Student	13%	35%	38%	14%	0%

For instance, one of the respondent head teachers told during interview.

"Contents' quality is very good. Teachers try very hard to develop contents or edited contents for the class." [$InHT_{06}$].

Interestingly, one of the respondent assistant teacher mentioned during FGD that.

"Teachers used contents are satisfactory but these need to added more qualities." [$AtFGD_{08}At_{01}$].

By observing by observing 6 classes, researcher found two good content and other four contents were average.

Researchers identified some key factors behind content qualities for Multimedia Classes. These are:

a) Effectiveness of training & taking help from teachers portal are the reasons for good quality.
b) Lack of Skills in making and editing, work load, very irregular practice, Lack of Motivation are the reasons for less quality's contents.

Monitoring & mentoring status of multimedia classes

Based on Table 8, it is seen that same number of the head teachers mentioned excellent and good on monitoring & mentoring status of multimedia classes. So, head teachers were very satisfied about the monitoring and mentoring. Most of the teachers seem very positive but most of the students said average on this regard.

Table 8. *Monitoring & mentoring status of multimedia classes*

Respondent	Excellent	Good	Average	Poor	Very Poor
Head Teacher	40%	40%	20%	0%	0%
Assistant Teacher	37%	35%	28%	0%	0%
Student	17%	30%	39%	14%	0%

For instance, one of the respondent head teachers told during interview.

"Monitoring and mentoring is in good conditions because I take necessary steps on the base of Upaziia Education office reports." [$InHT_{09}$].

Interestingly, one of the respondent assistant teachers mentioned during FGD that.

"If the Upazila Education office could send weekly monitoring reports than the quality of multimedia class would improve." [$AtFGD_{05}At_{08}$].

Interestingly, one of the respondent students mentioned during FGD that.

"Head teacher is not serious about multimedia class but other teachers are serious about multimedia class." [$StFGD_{04}St_{05}$].

By observing by observing 10 schools, researcher found four head teachers provided good monitoring and mentoring plan but others failed to do that.

Researchers identified some key factors behind monitoring and mentoring for multimedia classes. These are:

a) MMC dashboard, MMC monitoring APP & head teacher's leadership are the reasons for good monitoring and mentoring for multimedia classes.
b) Not so serious about providing data & head teacher's lack of monitoring are the reasons for less qualities monitoring and mentoring.

Infrastructural status of multimedia classes

Based on Table 9, it is seen that maximum number of the head teachers mentioned excellent about Infrastructural Status of Multimedia Classes. On the other hand, most of the teachers said average and most of the students said poor on this issue. So, it is very contradictory and they seem not sure about their schools' multimedia class infrastructure.

Table 9. Infrastructural status of multimedia classes

Respondent	Excellent	Good	Average	Poor	Very Poor
Head Teachers	50%	20%	20%	10%	0%
Assistant Teachers	17%	15%	37%	31%	0%
Students	26%	10%	26%	38%	0%

For instance, one of the respondent head teachers told during interview.

> *"Due to financial problem, we are facing problems of insufficient instruments and infrastructure for multimedia classes."* [$InHT_{10}$].

Interestingly, one of the respondent assistant teachers mentioned during FGD that.

> *"Quality of infrastructure and instrument are good because we have got very well-furnished multimedia classroom."* [$AtFGD_{02}At_{08}$].

Interestingly, one of the respondent students mentioned during FGD that.

> *"Projectors are not in good conditions. So, we cannot see properly at projection time in multimedia classroom."* [$StFGD_{03}St_{02}$].

By observing 10 schools, researcher find three schools have excellent Infrastructure & Equipment of Multimedia Classes, three schools have average and four schools have poor one.

Researchers identified some key factors behind present status for infrastructure & equipment of multimedia classes these are:

a) Government Helps, Good amount of school funds, good leadership in buying & protecting devices are the reasons for Infrastructure & Equipment of Multimedia Classes.

b) Lack of Government Helps, less amount of school funds, lack of leadership in buying & protecting devices are the reasons for less qualities Infrastructure & Equipment of Multimedia Classes.

Leadership & peer support of using multimedia classes

Based on Table 10, it is seen that maximum number of the head teachers mentioned excellent about Leadership & Peer Support of Using Multimedia Classes. On the other hand, most of the teachers said good and most of the students said average on this regard. So, it can be said all the schools has commendable Leadership & Peer Support of Using Multimedia Classes.

Table 10. Leadership & peer support of using multimedia classes

Respondent	Excellent	Good	Average	Poor	Very Poor
Head Teachers	50%	30%	20%	0%	0%
Assistant Teachers	23%	40%	21%	16%	0%
Students	14%	35%	44%	7%	0%

For instance, one of the respondent head teachers told during interview.

"We share good support to each other because we need to send regular update to District or Upazila education office on Multimedia class." [$InHT_{03}$].

Interestingly, one of the respondent students mentioned during FGD that.

"Sometimes teachers take help from ICT and Math Teachers for operating Projectors and developing digital contents." [$StFGD_{03}St_{02}$].

By observing 10 schools, researcher find six schools have excellent leadership & peer support of using multimedia classes plan and four schools have average one.

Researchers identified some key factors behind present status for leadership & peer support of using multimedia classes. These are:

a) Head teacher's good leadership, fixed multimedia classes in routine, friendly environment among teachers are the factors behind good leadership & peer support of using multimedia classes.
b) Head teacher's poor leadership, no fixed multimedia classes in routine, too much work load hamper taking peer support are the factors behind poor leadership & peer support of using multimedia classes.

Status of the digital content developed by teachers

To present the status of the digital contents developed by teachers, data was analyzed in six (6) sub themes and presented below.

Volume of digital contents developed by teachers

Based on Table11, it is seen that mostly head teachers mentioned very few numbers of digital contents developed by teachers where assistant teachers mentioned bit higher number about contents developed by teachers in a week. But no one mentioned weekly 11 and above, neither zero about teachers' own developed digital contents.

Table 11. *Status of the digital contents developed by teachers*

Respondents	Weekly 11 and above	Weekly 8-10	Weekly 4-7	Weekly 1-3	Weekly 0
Head Teachers	0%	10%	30%	60%	0%
Assistant Teachers	0%	17%	54%	29%	0%

For instance, one of the respondent head teachers told during interview that.

> *"My school's teachers usually develop at least one content in a week, because of reluctance and carelessness about making digital contents."* [$InHT_{07}$].

Interestingly, one of the respondent assistant teachers mentioned during FGD that.

> *"Due to technological insufficiency and electrical problem, teachers cannot provide time to develop contents."* [$StFGD_{02}St_{06}$].

It was requested to all 100 teachers to give their own developed digital contents to the researchers but only 14 teachers provided total 18 contents. Where, other teachers requested researcher to take in other days.

Maximum teachers use contents by downloading from teachers' portal or sharing from other teachers. Most of them are reluctant to make content. Head Teachers are not sure about exact number of teachers own contents. Teachers were not confident while giving this information.

The factors behind the good amount of multimedia classes were fixed multimedia classrooms & good monitoring for daily class. And the factors behind irregular development of multimedia contents were:

a) Head teachers are not concern about teachers' content development.
b) Assistant teachers shows of reasons for not developing contents like-workload, availability of others contents.
c) There is no target for developing contents from authority.

Types of digital contents developed by the teachers

Based on Table 12, it is seen that mostly teachers developed digital contents with the mix of text, images and videos in power points software. Some teachers also consider text and text with images as a digital content. Only few of them consider only images, only videos and image with videos as a digital content.

Table 12. *Types of digital contents developed by the teachers*

Respondents	Only text in ppt	Text+image in ppt	Text+image+video in ppt	Only image in ppt	Only video in ppt
Head Teachers	0%	20%	10%	20%	20%
Assistant Teachers	70%	52%	19%	26%	21%

For instance, one of the respondent head teachers told during interview.

> *"Teachers usually develop contents with text and images because they face difficulties in downloading videos"* [$InHT_{02}$].

By analyzing 18 teachers' own developed digital contents researchers find:

- Only text in power point = 04 out of 18
- Text and Image in power point = 08 out of 18
- Text, Image and Video in power point = 06 out of 18

Other types of contents were not found. And the factors behind irregular development of multimedia contents were:

a) Effect of the content development training from government.
b) No idea about that a picture or an image can be used as a digital content.

Relevancy of digital contents with curriculum and textbook

Based on Table 13, it is seen that no head teacher and assistant teacher found who mentioned contents are not relevant with curriculum and textbook about teachers developed digital contents.

Table 13. Relevancy of digital contents with curriculum and textbook

Respondents	Most relevant	Relevant	Not relevant
Head Teachers	80%	20%	0%
Assistant Teachers	67%	33%	0%

By analyzing 18 teachers' own developed digital contents researchers find:

- Most Relevant = 03 out of 18
- Relevant = 05 out of 18
- Not relevant = 10 out of 18

And the factors behind not relevant with curriculum and textbook were:

a) Lack of planning while developing a content.
b) Did not studied properly prior to develop.
c) Lack of knowledge about pedagogy.

d) Most of contents did not cover the textbook contents.
e) Head teachers and Assistant teachers were not concerns about those gaps.

Digital contents having scopes for students' engagement

Data based on Table 14, it is seen that no head teachers and assistant teachers are found those who mentioned contents are not engaging with students about teachers developed digital contents.

Table 14. Digital content has scopes for students' engagement

Respondents	Highly engaging	Engaging	Not engaging
Head Teachers	50%	50%	0%
Assistant Teachers	56%	44%	0%

For instance, one of the respondent head teachers told during interview.

> *"Digital contents are only shown for 15 to 20 minutes, other times teachers engage the students in different activities"* [$InHT_{10}$].

Interestingly, one of the respondent assistant teacher mentioned during FGD that.

> *"Due to infrastructural insufficiency, teachers get little scope to engage students."* [$StFGD_{03}St_{06}$].

By analyzing 18 teachers' own developed digital contents' animations, researchers found:

- Interactive = 07 out of 18
- Static = 11 out of 18

And the factors behind static contents were:

a) Lack of technical skills while developing a content.
b) Did not planed properly prior to develop.
c) Lack of knowledge about pedagogy.
d) Head teachers and Assistant teachers were aware about the importance about engagements.
e) Monitoring does not cover this issue.

Quality of technological skills in digital contents

Data based on Table 15, it is seen that most of the head teachers and assistant teachers were satisfied with technological skills in developing digital contents.

Table 15. Quality of technological skills in digital content

Respondents	Excellent	Satisfactory	Below satisfactory
Head Teachers	40%	60%	0%
Assistant Teachers	26%	50%	24%

For instance, one of the respondent head teachers told during interview.

> *"Not much technological skills are involved in developing Digital contents because teachers do not get regular training."* [$InHT_{01}$].

By analyzing teachers' technology skills on developing those 18 digital contents, researchers find:

- Excellent = 04 out of 18
- Satisfactory = 07 out of 18
- Below Satisfactory = 07 out of 18

And the factors behind below technological skills while developing contents were:

a) Lack of technical skills while developing a content.
b) Lack of innovative technical skills while developing a content.
c) Lack of beautification or over beautification.
d) Lacking in selecting clear images or videos.
e) Monitoring does not cover this issue.

Digital contents' displaying duration

Based on the data from Table 16, it is seen that most of the head teachers and assistant teachers mentioned that teachers developed digital contents were displayed for full class.

Table 16. Digital content displaying duration

Respondents	Full of class time (40-50mins)	Half of the class time (20-25 Mins)	10-20 mins	< 10 mins
Head Teachers	60%	40%	0%	0%
Assistant Teachers	42%	32%	26%	0%

By analyzing the approximate display time of those 18 digital contents in a class time, researchers find:

- Approximately Full of the Class time = 14 out of 18
- Approximately Half of the Class time = 04 out of 18
- Approximately 15 minutes of the Class time = none
- Approximately 10 minutes of the Class time = none
- Below 5 minutes of the Class time = none

And the factors behind digital contents display time about the maximum of class time were:

a) Lack of idea about displaying.
b) Too much slides in some contents.
c) Lack of concepts on when to use or not use.
d) Some HT & Teachers were not aware about the importance about displaying time.

e) Monitoring does not cover this issue.

Case study

The case study done by the researchers presented below:

1. The researcher spent two weeks at Kalirbazar U P High School, Cumilla Sadar South upazilla, Cumilla as a practice teacher under 1 year B.Ed training from Government Teachers' Training College, Cumilla. He observed all the aspects regarding multimedia classroom.
2. Kalir Bazar Union Parishad High School established in 1943. Currently it is running by 21 teachers and 1100 students. There are 3 teachers who got ICT content development training and there is no fixed multimedia classroom. But the head teacher is very enthusiastic about multimedia classes.

Major findings of this study

Frequency of multimedia classes in schools

Researcher observed that daily at least 2 multimedia classes were taken. Though there was no fixed multimedia classroom but good monitoring and motivation by head teacher was the reason for daily class.

Standard of multimedia class

In those days, researcher observed few classes and the standard were average. Lack of training and skills as well as too much class was the reason for average standard of multimedia classes.

Teachers' skills of using multimedia class

Researcher found some teachers were skilled in taking multimedia class and some were not so skilled of taking these classes. The reasons behind skilled class were effect of training & regular practice. And irregular practice & work load were reason for unskilled multimedia class.

Quality of contents for multimedia class

Researcher found that quality of contents was satisfactory. This was happened because of effectiveness of training, in-house training and taking help from teachers portal.

Monitoring & mentoring status

Researcher found that monitoring and mentoring were satisfactory. This was because MMC dashboard, MMC monitoring App and head teacher's leadership.

Infrastructure & equipment of multimedia class

Researcher found that infrastructure & equipment of multimedia class were not satisfactory because this school did not get enough government helps & funds. But the school has good leadership in buying & protecting devices.

Leadership & peer support for using multimedia class

Researcher found that there was good support among colleague and from leader as well for multimedia classroom. The reasons behind that was head teacher's good leadership about applying ICT. Fixed ICT classes in routine, friendly environment among teachers are some other reasons.

Volume of content developed by the teachers

Researcher observed there were three teachers who develop at least one contents in a week. Teachers mentioned reasons for not developing contents were workload, availability of other teachers' contents.

Types of contents

Image with text in power point or Image and video with text in power point were two types they usually made. Effect of the content development training from government and less idea about that a picture or an image can be used as a digital content were the reasons for that.

Relevancy with curriculum and textbook

Researcher collected four digital contents made by the school teachers and found those were average satisfactory in relevancy with curriculum and textbook. The reasons behind those were lack of planning while developing a content, lack of study prior to develop, lack of knowledge about pedagogy, etc. Head teachers and teachers were not concerns about those gaps.

Scopes for students' engagement

Researcher collected four digital contents made by the school teachers and found those were average interactive regarding scope for students' engagement. The reasons behind this were lack of knowledge about pedagogy and teachers were not aware about the importance about engagements.

Quality of technology skills In Contents

Researcher collected four digital contents made by the school teachers and found those were in average quality considering technology skills. The reasons behind this were lack of technical skills while developing content, lack of beautification or over beautification, lack of skills in selecting clear images or videos, etc. However, monitoring does not cover this issue.

Duration of Displaying Digital Content in a Class time

Researcher collected four digital contents made by the school teachers and found those could be displayed till full class time. The reasons behind this were lack of idea about displaying, too much slides in some contents, and lack of concepts on when to use or not use, teachers were not aware about the importance about displaying time and monitoring does not cover this issue.

DISCUSSION

We have found out that the standard and quality of multimedia classes is average due to a lack of equipment and training among the teachers. Since ICT gives students and teachers more flexibility to adapt their instruction to individual requirements, society is pressuring schools to provide the necessary training in ICT's technical applications. This indicates that introducing and integrating ICT at diverse educational levels and formats is the most difficult task.

We have found out in our study that digital contents are not that relevant to textbooks. The context of current technology and obligations must be taken into account when analyzing instructors' resistance to implementing innovations. For instance, many instructors are currently unable to make well-informed decisions regarding ICT to support their educational objectives. Clearly, several variables continue to make integrating ICT into the curriculum challenging. As a result, ICT's influence on education did not result in any radical adjustments. The two most common uses of computers by students are for word processing and drill and practice (Eze et al., 2020; Rachmadtullah et al., 2018).

ICT is having an impact on classroom instructional approaches. ICT has led to changes in how educators teach and how they do things. ICT is a powerful tool for information processing, covering every aspect of life and requiring new skills. The next generation must therefore be proficient with ICT, learn the necessary skills, and have classroom access to computers and networks. School is an entity that stores information and knowledge. Consequently, ICT should become an important tool for information management at all levels of the education system. To build an effective learning environment and enhance students' lifelong learning ability and habits, schools must revise their current teaching methods and resources. Every classroom, library and teacher's room should be equipped with ICT because it is the most effective tool to achieve this goal. Despite the fact that there is still an exciting potential, ICT has yet to make any major breakthroughs in education.

Utilizing computers at a young age allows students to acquire ICT skills that assist school processes (Kurniawan et al., 2021). It is widely believed that ICT has made important contributions to changes in instructional techniques and educational innovation. Therefore, policy makers and project managers must consider the input parameters that can function together to determine the desired effect of ICT in education. Adapting computer use to government policies and activities to improve curriculum, teaching, assessment and measurement, and teacher training increases the likelihood of greater student learning and other outcomes (Dhital, 2018; Osaat, 2019; Pearl Villalon Tomaro, 2018; Rana & Rana, 2020).

Given the importance of technology, education policies must highlight the new ICT-based teaching paradigm. ICT can bring learning tools that are more practical, relevant, flexible, and effective for disadvantaged students. Policies should accommodate retraining of educators in the use of ICT in the classroom. Given the data findings in this research, it shows that the challenge for teachers is to operate multimedia-based classes. On the other hand, teachers must provide a professional learning environment so that students can apply their newly acquired ICT skills to various applications in an ICT-based environment. Most education plans take into account the need for ICT infrastructure, but neglect the need for locally developed teaching materials. Instructional content creation tools remain a neglected sector, taking a toll on education.

As a contemporary technology that streamlines and simplifies people activities, ICT is not only beneficial in a variety of ways, but also has a number of disadvantages. Many citizens, both within and outside the education system, see ICT as the most essential treatment or solution to school issues and growth. However, there are further circumstances that might be considered limiting the use of ICT in education. There are instructor limits, student limits, and technology limits. These factors have the potential to limit the educational benefits of ICT. The teacher's attitude has a considerable impact on the teaching and learning process which is facilitated by computers and internet connections. Although instructor attitudes about the use of technology are very important, some findings indicate that teachers lack understanding of the extent to which technology can facilitate and enhance learning. Some instructors may have a favorable view of technology, but hesitate to use it in the classroom because of poor self-efficacy and a tendency to feel unqualified to teach using technology. The teacher's attitude increases the integration of ICT in learning (Kale & Goh, 2014; Sánchez et al., 2012; Semerci & Aydın, 2018).

In addition, many teachers do not have the necessary ICT skills and are not comfortable using technology in the classroom, and do not have the necessary training. Meanwhile, the use of ICT in education is limited by student behavior. Computers and the internet that are properly used by students have great benefits that are beneficial to their performance and attitudes (Edmunds et al., 2012; Islam & Fouji, 2010; Khattak & Jan, 2015). Nonetheless, it is very common to notice restrictions on student behavior. Students who use technology excessively for inappropriate purposes, leaving them with less time to study and study. ICT is not used properly, so the negative impacts are greater than the benefits. For example, when children use the Internet, the amount of information available can create confusion. As a result, instructors spend a great deal of effort preventing children from accessing irrelevant websites. Then, to be careful, it is important to recognize the main obstacles to the use of ICT in education because it is related to changes in student behavior.

Another drawback of ICT adoption in education is technology-related. The high prices of technology and maintenance of facilities, the high cost of replacement parts, virus assaults on software and computers, internet connection outages, and insufficient power are among the limits of the use of ICT in technology-related education. Policy, management, infrastructure, learning content and languages, capacity development, and financial restrictions might impede the integration of ICT into education institutions. ICT-enhanced education necessitates distinct objectives, the mobilization of resources, and the political commitment of relevant institutions (Salam et al., 2018). In addition, it is wise to define educational goals at various levels of education and training, as well as various modalities of ICT use that can help achieve these goals. Therefore, policy makers must be aware of the potential of ICTs in various situations and for various purposes.

In addition, the infrastructural issues that may occur include a lack of suitable buildings and rooms to house the technology, a deficiency of power supply and telephone connections, and a scarcity of various ICT. Prior to planning the integration of ICT into educational systems, one must thus address infrastructure-related difficulties. Implementation of ICT in education demands sufficient infrastructure (Binsaleh & Binsaleh, 2021; Charoen, 2018; Ngamman, 2019), especially in Bangladesh (Obaydullah & Rahim, 2019; Sultana & Shahabul, 2018)

The capacity of teachers is another challenge for the successful integration of ICT in education (Agyei, 2021; Asuman et al., 2018; Henderson et al., 2012). In actuality, the competence gap among its implementers is one of the hurdles to the integration of ICTs into education systems. For example, instructors need professional development to learn skills with particular applications of ICT, integrating into present curriculum, curricular revisions connected to its usage, changes in teacher role, and underpinning educational philosophies like constructivism. In light of this, every effort to integrate ICT into education should coincide with the professional development of teachers. ICT integration is also reliant on the school administration. Lack of school administrative support is also a significant obstacle. Therefore, for ICT integration to be successful, administrators must be knowledgeable of the technological, management, curricular, and administrative of ICT usage in education (Chandio, 2021).

Incorporating ICT into education is additionally complicated by the need to learn subject and language. Content creation is a crucial aspect that instructors sometimes ignore. When incorporating ICT into education, we must ensure that the learning material is relevant to the target groups. Regarding language, the majority of educational software is written in English, but English competence is low in many developing nations; this is one hurdle to the ICT integration into education.

Another important barrier is money. ICT in education programs necessitates substantial capital expenditures, and developing nations must forecast the benefits of ICT usage in order to justify the expense compared to available alternatives. According to studies, in impoverished countries such as Bangladesh, a large proportion of the population lives below the international poverty line. It is very difficult to handle the vast sums of money required for efficient integration of technology into educational institutions (Avcı, 2022; Khan et al., 2012).

CONCLUSION

Due to an insufficient number of teachers, secondary school teachers in Bangladesh have very little time to prepare for delivering an efficient multimedia class. Despite this, a significant number of instructors strive to improve the situation and demonstrate the utmost commitment. However, comprehensive training on the efficient use of ICT in the classroom can equip and empower teachers, which is essential for providing excellent education. After implementing multimedia classrooms project, quantity is achieved to some extent. Now it is the high time to consider quality and take proper steps for this.

The MMC model is being implemented in the educational institutions of different types, such as, primary schools, secondary schools and madrasas. According to a2i, the most number of multimedia classrooms have been established in the secondary schools. The study will be conducted only on the secondary schools equipped with multimedia classrooms.

The MMC model includes number of activities, for instance, establishing multimedia classrooms, providing training on digital content development, making electronic version of textbooks and running a teachers blog. The study will cover only the activities directly related to classroom practices. On the other hand, among the diverse educational stakeholders, the study will choose only the school teachers and the students of the

respective schools. Above all, the study will search for the school level primary data for getting the clear picture of the MMC model.

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