WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Creative Questioning: Successful or Unsuccessful in the Field of Mathematics Education in Bangladesh

Shekh Nazia Jahan

Assistant Professor, Mathematics
Govt. Titumir College, Dhaka

ABSTRACT

Learning outcome largely depends on smart questioning technique of the public or any type of competitive examinations. Which direct the secondary and higher secondary education of Bangladesh towards a major reformation starting from structured question to creative questioning pattern and other teaching enhancement techniques. This study investigates the effectiveness of creative questioning in mathematics education at the higher secondary level in Bangladesh. Creative questioning was introduced as part of a nationwide reform to reduce rote learning and foster critical thinking, problem-solving, and conceptual understanding. Data were collected from 20 purposively selected mathematics teachers across higher secondary colleges in Dhaka using questionnaires and opinionnaires. The findings reveal that while 98% of teachers support the creative questioning approach and 95% believe it enhances student creativity, several systemic barriers hinder successful implementation. These include inadequate teacher training, insufficient practice opportunities, inappropriate textbooks, and inconsistencies in exam timing and marks distribution. Furthermore, 70% of teachers questioned the reliability of the current creative questioning system in mathematics, and 100% emphasized the need for grassroots teacher involvement in policymaking. Despite these challenges, teachers acknowledge the potential of creative questioning to improve learning outcomes if supported by adequate training, curriculum alignment, and instructional resources. The study concludes that while creative questioning is a promising reform, its success depends on systemic improvements and stronger teacher empowerment.

Keywords: ***Creative Questioning, Mathematics Education, Higher secondary level, Educational reform, Critical thinking, Rote Learning.***

1. Introduction

Bangladesh has undertaken significant reforms in its education system over the last decade, with a particular emphasis on assessment methodologies. Among the most transformative changes has been the introduction of creative questioning in public and competitive examinations, designed to move away from rote memorization and towards evaluating higher-order thinking skills (NCTB, 2012). In mathematics education, this reform has sought to enhance students' conceptual understanding, creativity, and problem-solving abilities.

Mathematics plays a foundational role in equipping learners with logical reasoning and problem-solving skills essential for scientific and technological advancement. However, Bangladeshi students have historically performed poorly in international assessments (TIMSS, PISA) and national exams, reflecting systemic weaknesses in pedagogy and evaluation. The traditional examination system has long encouraged formulaic problem-solving at the expense of conceptual clarity. The introduction of creative questioning, therefore, was envisioned as a paradigm shift to align Bangladesh's education system with global standards. Despite this noble objective, implementation has been fraught with challenges including teacher readiness, inequitable resource distribution, and systemic inertia. This study explores teachers' perceptions, experiences, and preparedness to determine whether the creative questioning reform has been successful or whether it has introduced new barriers.

2. Literature Review

2.1 Creative Questioning

Creative questioning is rooted in constructivist learning theories (Piaget, 1950; Vygotsky, 1978), emphasizing active student engagement and higher-order thinking skills (HOTS). Bloom's Taxonomy (1956) further classifies question types, with "creative" questions often targeting *analysis*, *synthesis* and *evaluation* levels. In mathematics, such questions demand problem-solving flexibility and real-world application (Schoenfeld, 1985), moving beyond algorithmic repetition.

2.2 Global Practices in Mathematics Assessment Reform

Countries like Singapore and Finland have successfully integrated creative questioning into national exams, linking it to improved critical thinking (OECD, 2018). Conversely, similar reforms in India and Pakistan faced challenges due to teacher resistance and inadequate training (NCERT, 2017; UNESCO, 2019). These cases highlight that teacher preparedness and systemic support are pivotal for success.

2.3 Creative Questioning in Bangladesh's Education System

Bangladesh's National Education Policy 2010 and National Curriculum Framework 2012 mandated creative questioning to reduce rote learning (NCTB, 2012). Studies (e.g., Ahmed, 2018; Rahman & Islam, 2020) note:

i) Positive Intent: Teachers acknowledge the potential of creative questions to deepen conceptual understanding.

ii) Implementation Gaps: 60% of surveyed teachers reported *no formal training* (DPE, 2021), while rural schools struggled with resource disparities.

iii) Exam-Centric Culture: Students and teachers often revert to "model answers" due to pressure to score high (BEDU, 2020).

2.4 Gaps in Existing Research

Most prior research addresses policy intentions or general teacher attitudes but lacks mathematics-specific analyses. Very few studies provide empirical evidence of how creative questioning impacts student outcomes in mathematics. This study attempts to fill this gap by focusing specifically on mathematics teachers' perceptions and identifying structural and systemic barriers that influence classroom realities.

3. Research Methodology

This study employed a mixed-methods explanatory design to capture both quantitative and qualitative perspectives. The sample consisted of 20 purposively selected mathematics teachers from five higher secondary colleges in Dhaka. Instruments included structured questionnaires and opinionnaires to capture teachers' expectations, perceptions, and challenges regarding creative questioning. The questionnaires addressed issues such as teacher preparedness, perceptions of student creativity, fairness of marking schemes, adequacy of exam timing, and systemic barriers. Opinionnaires were used to collect more detailed qualitative perspectives on areas for reform. Data were analyzed descriptively using frequency distributions and percentages, and thematically to identify recurring challenges and recommendations. The explanatory design allowed quantitative findings to be enriched and contextualized by teachers' qualitative insights

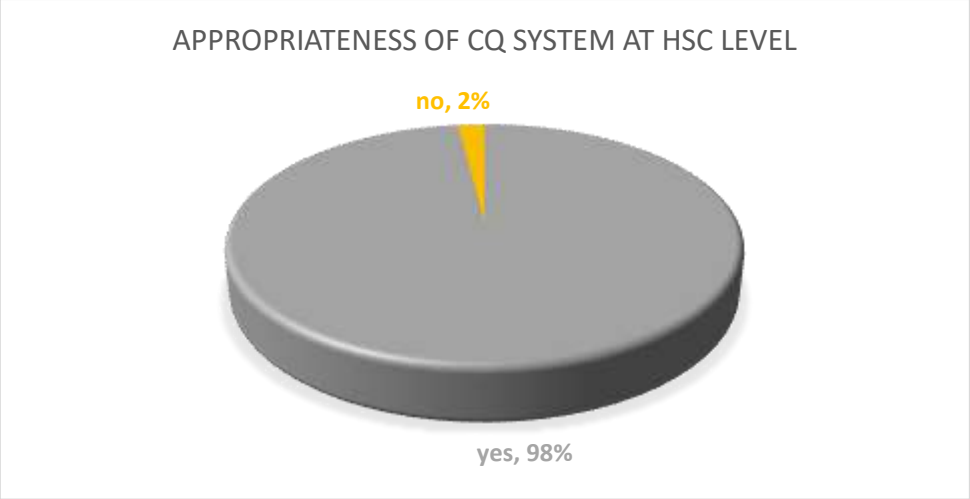
4. Data Analysis

4.1 First step: Teachers' expectation from (CQ) creative questioning concept

a) Appropriateness of CQ system at HSC level:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Do you support the creative question concept at higher secondary level?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Yes	98%
No	2%

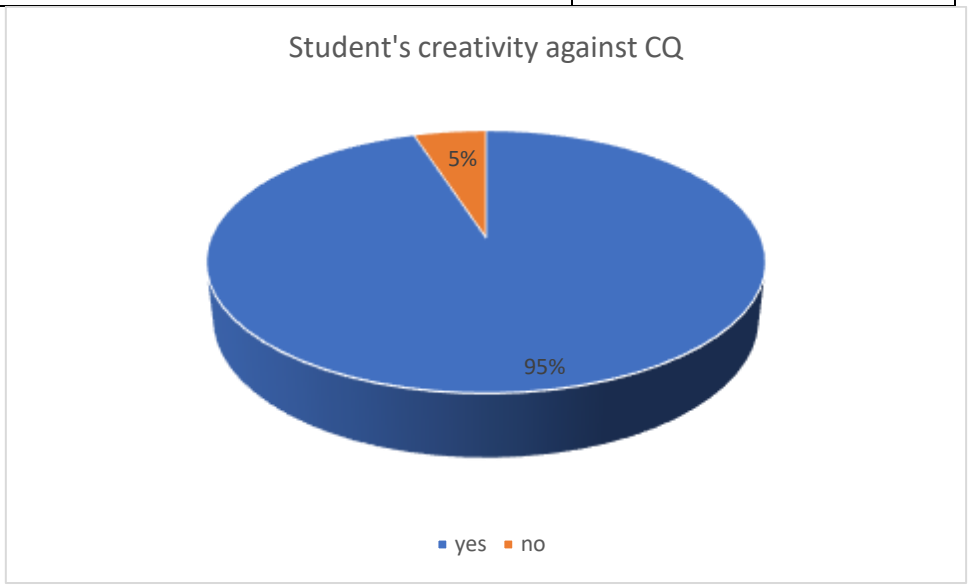


The data chart of represents that 98% teachers have supported to implement the creative question concept at higher secondary level in Mathematics. The researcher sampled 20 higher secondary mathematics teachers about their expectation for creative question in their subject at the concerned level. 98% of them gave their opinion positively in against the question of whether they support the creative question concept in the higher secondary level or not. That is only 2% teachers don't want this concept at this level.

b) Students' creativity against CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Does creative question improving creativity of the students at higher secondary level?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Yes	95%
No	5%

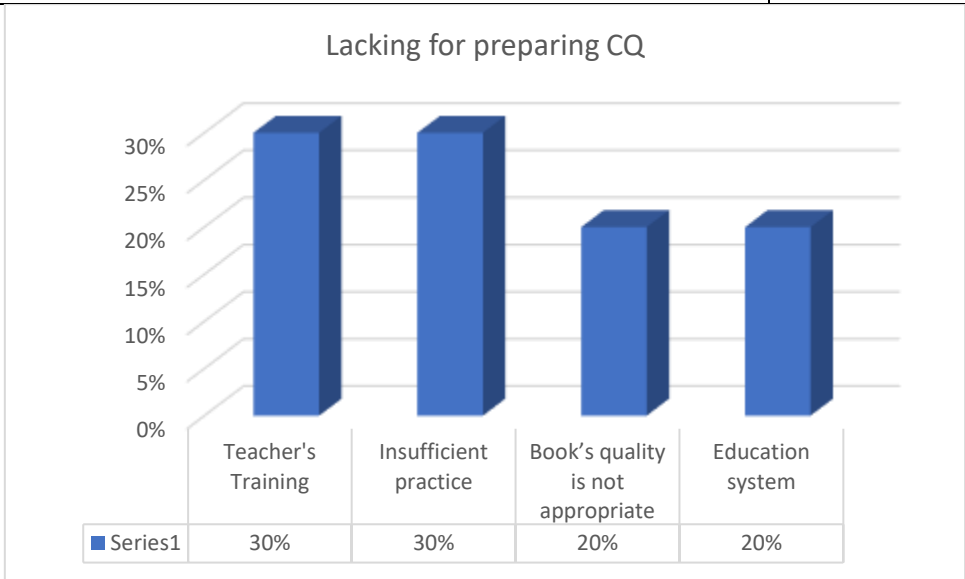


This figure represents that almost all of the teachers (95%) are thinking that creative question can improve the creativity of the students and the creative question has the field which can make students thinking. And only very few of them that is, only 5% of the teachers think that the existing system cannot improve the creativity of the students. They think, if we really want to improve students' creativity by using creative question and make them to thinking for answering then we have to modified the existing creative question with the question pattern.

c) Causes for lacking to preparing CQ for the course teachers:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "In your view, what is the lacking of creative question to make it proper?" The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Teacher's Training	30%
Insufficient practice	30%
Book’s quality is not appropriate	20%
Education system	20%

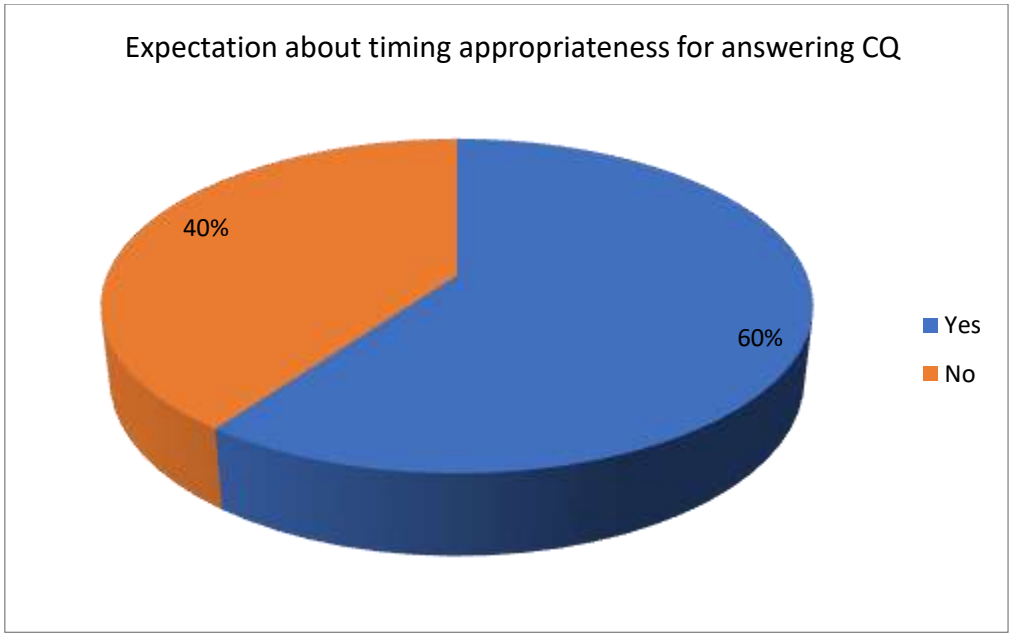


The figure represents that a part (30%) of the teachers perceive that the main lacking to prepare proper creative question is not to provide enough training for the classroom teachers. Because they think only training can make the teachers understanding to prepare the proper creative question. Same as, another part of the teachers (30%) think that insufficient practice is also liable for the lacking of proper CQ. The smaller part (20%) of the teachers perceives the opposite thinking that the lacking of inappropriate books is the most important issue for this. Actually these teachers are thinking that main lacking is hiding within the books which are provided. We need proper books which have the materials to make the creative questions. And the last part (20%) teachers also think that the running education system is not appropriate for making the perfect creative question in Mathematics.

d) Appropriateness of timing for answering CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question “Do you think that the timing is appropriate for the existing system of creative question?”. The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Yes	60%
No	40%

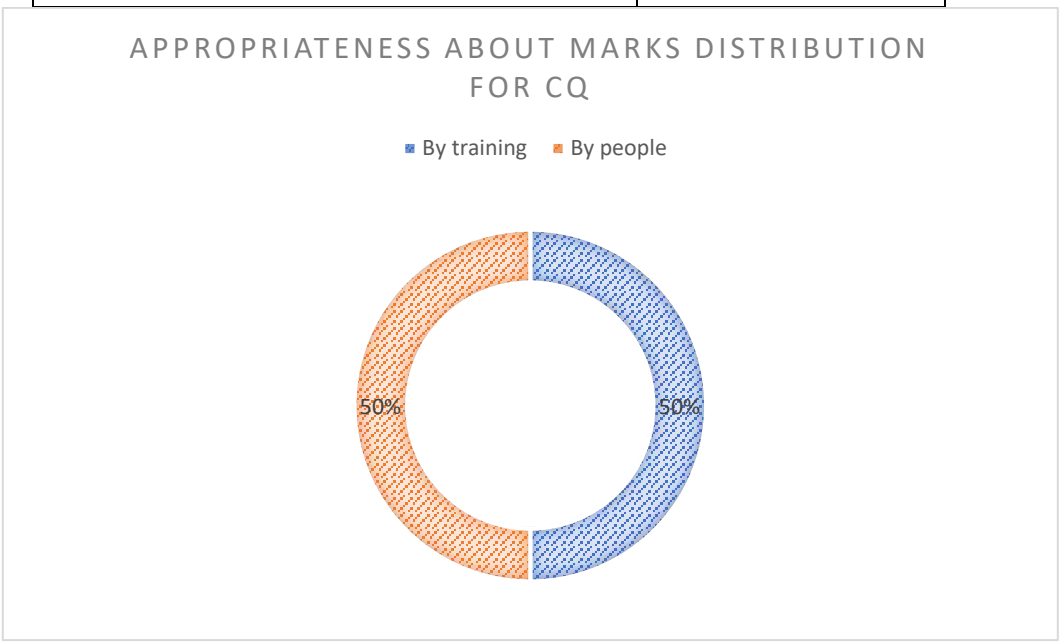


The figure represents that by the question whether the timing to answering creative question is appropriate or not, I identified the teachers' understanding where the greater half of the teachers (60%) stated that the existing timing situation is perfect to answering the creative question for the students. But against this same question, a group of teachers (40%) think the timing is not so appropriate. They think timing schedule should be modified with the pattern of the question by which students can think with proper time by using their knowledge and understanding as well.

e) Appropriateness of marks distribution for CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Do you think that the existing marking process is appropriate for the creative question?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Yes	50%
No	50%

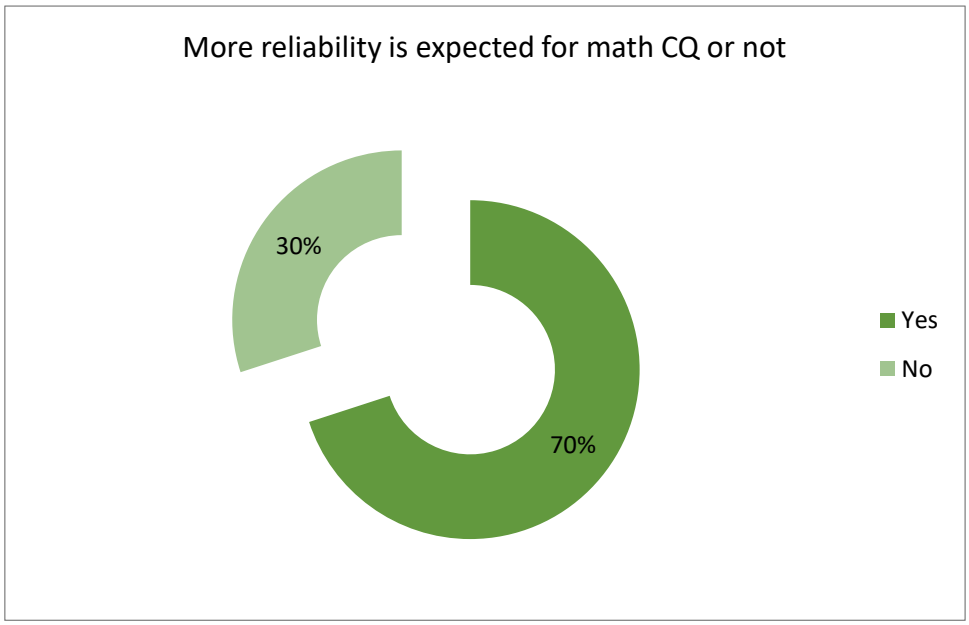


The figure represents that it arises a confusing situation among the teachers by this question where just half of the teachers make their understanding that it is okay with all over the situation. But the other half thinks that the marking distribution is not so appropriate against the creative type question. Because it should be modified and need to re-arrange the marking schedules.

f) More reliability is expected for math CQ or not:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Do you think that more reliability is expected in creative question concept in mathematics?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Yes	70%
No	30%

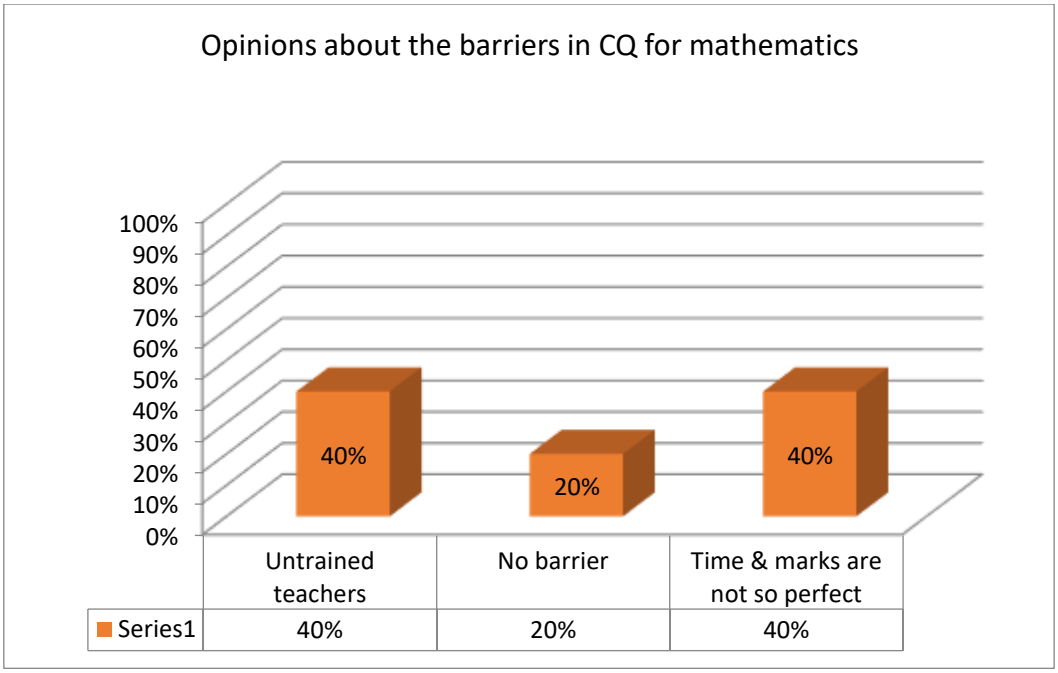


The figure represents that by the question that whether the teacher measure the concept of creative question enough to capable as a reliable system for mathematics or not, I got different perceptions. A huge percentage of the teachers (70%) perceive that it will be reliable if the question pattern can satisfy the actual theme of creative questions. But almost one-third of them (30%) perceive that creative question cannot be a reliable concept for mathematics as because in Bangladesh it is not possible to fulfill the actual criteria of creative question when the question will be providing or prepared.

g) Opinions about the barriers in CQ for mathematics:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "What type of barriers may occur for the upcoming concept of creative question in mathematics?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Untrained teachers	40%
No barrier	20%
Timing to answer and marks distribution is not so perfect	40%



The figure represents that the mathematics teachers provided their opinion about the possible barriers of the creative question in Mathematics, then a little less of half portion of the teachers (40%) think that the untrained teachers are the main barrier to apply the concept of creative question as because they do not understand the concept properly and moreover sometimes they also unrealized the concept which is very much harmful. A very little part (20%) of teachers do not think that any barrier may occur. And again portions (40%) of the teachers are thinking that the main barrier will be the improper distribution of time schedule and marks distribution. They think the concept will be work out if the authority can modify the time schedule and also can re-arrange the marks distribution.

h) Voice of grassroots math teachers for CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Do you think that there should be a voice of grassroots mathematics teachers before implementing creative question concept?". The total outcome of the teachers about this statement is shown below in chart and interpreted after that.

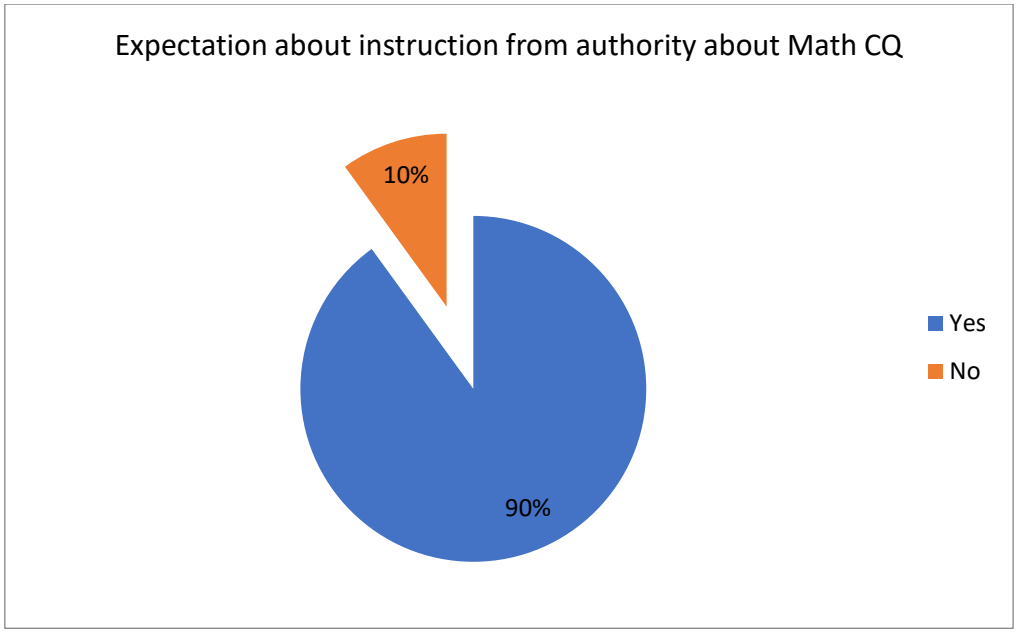
Concepts	Percentage
Yes	100%

The data chart represents that the researcher collected data from 20 higher secondary level's Mathematics teachers for this statement. Here, we can see from the data that all the teachers are giving their opinion positively in against the question of whether there should be exist the grassroot level's mathematics teachers voice or not. It implies that all the teachers think that it is mandatory to take the opinion of the grassroot level/s mathematics teacher before the implementation of the creative question in mathematics as if every type of student in anywhere in this country can be measured by that creative question.

i) Expectation for instruction from authority about math CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Do you support that the instructions are not enough from the authority about the creative question concept for the mathematics teachers?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Answer	Percentage
Yes	90%
No	10%



The figure represents that it is a clear conception that almost all the teachers (90%) perceive that there is a huge lacking of instruction from the authority to the mathematics teachers about the concept of creative question. They think instruction may exist but it did not reach to all the levels of the teachers. Only a very little pointed group of teachers (10%) think that the lacking is not about the instruction but about the willingness of the teachers that they are not so interested to being informed about it.

j) Expectation about the modification for math CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "Do you expect modification of the creative question concept before implementing it in mathematics?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Answer	Percentage
Yes	80%
No	20%

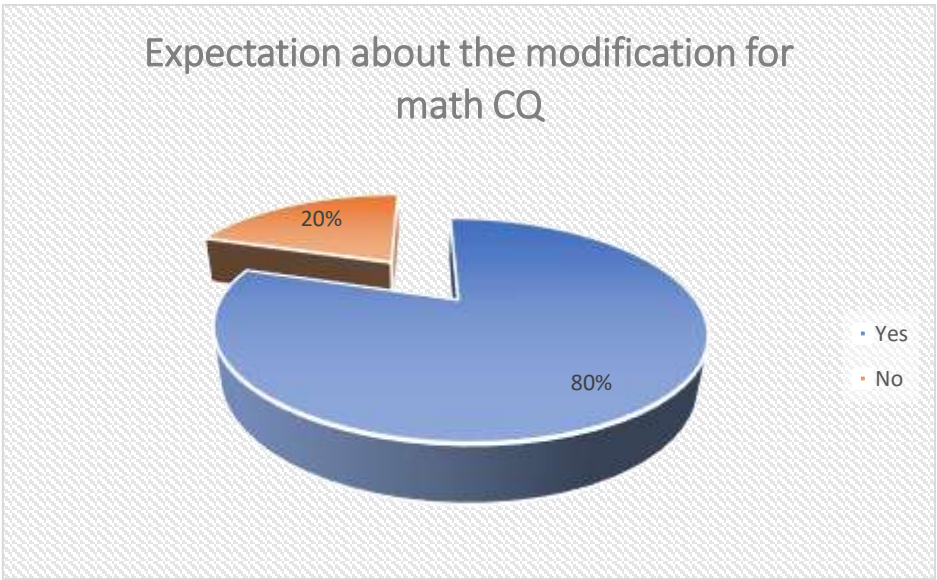


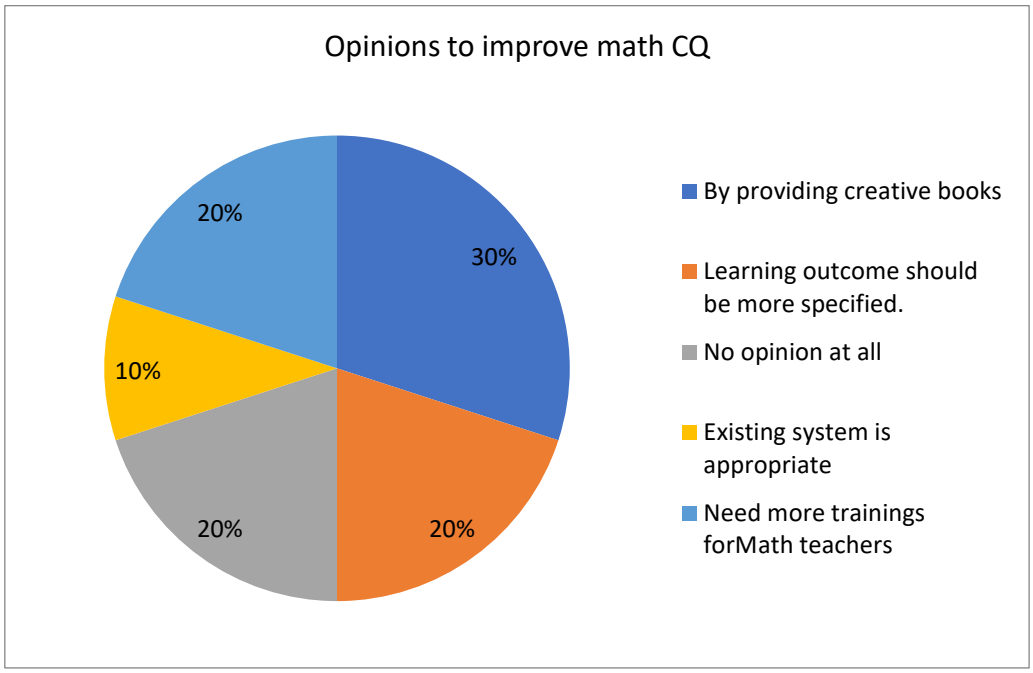
Fig : Modification is expected for Math CQ

The figure represents that a huge number of teachers' (80%) concept is that the concept of creative question system need more modification before its implementation. It is needed on the marking distribution and the time schedule as well. The rest of the teachers (20%) perceive that modification is not so necessary in mathematics creative question.

k) Opinions to improve math CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "How the creative question concept of mathematics may improve?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Answers	Percentages
By providing creative books	30%
Learning outcome should be more specified.	20%
No opinion at all	20%
Existing system is appropriate	10%
Need more trainings for Math teachers	20%



The figure represents that when I asked the mathematics teachers about the process that the creative question in mathematics can be improved. Almost one-third (30%) teachers are thinking that only by providing books with proper context can improved the creative question system because books are the main source of knowledge always. One-fifth of the teachers (20%) think that books are okay but the learning outcome should be more specified in the classroom teaching.

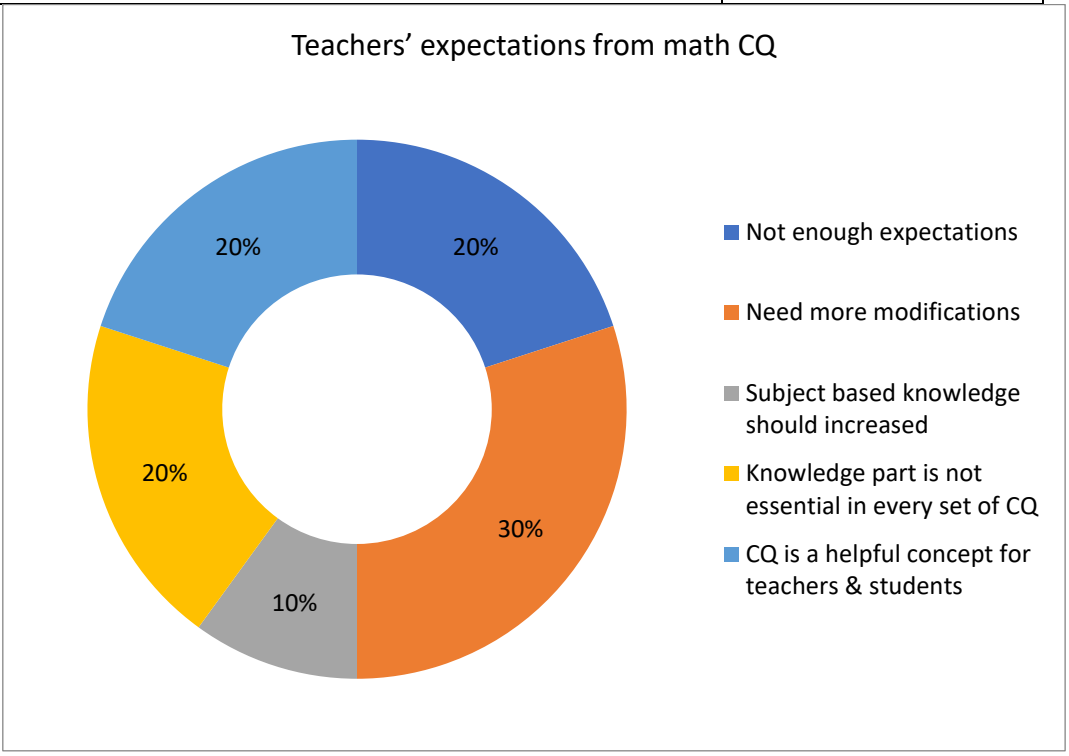
Another one-fifth (20%) teachers do not agree to give any opinion about the improvement of the creative question in mathematics. Only one-tenth (10%) teachers think that there need no improvement and the existing system which is going to applied in mathematics is appropriate.

The rest of the one-fifth (20%) teachers think that the creative question can be improved only by providing more training for the classroom teachers. Because all the processes of knowledge gathering has started from the teachers in the classroom. So, first of all, the classroom teachers should be properly trained up.

l) Teachers' expectations from math CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of expectation to the question "What is your expectation from the upcoming mathematics creative question concept?" The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentages
Not enough expectations	20%
Need more modifications	30%
Subject based knowledge should increased	10%
Knowledge part is not essential in every set of CQ	20%
CQ is a helpful concept for teachers & students	20%



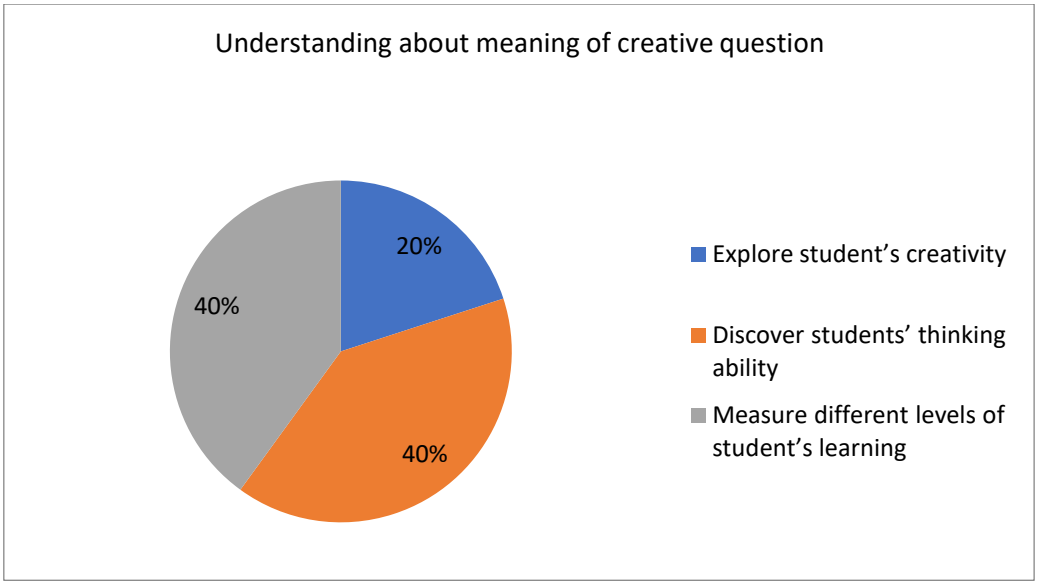
The figure represents that the last query was about the perception of the mathematics teachers about the upcoming concept of creative question in their subject. The statistic of the teachers' perceptions is like: One- fifth (20%) of the teachers are still not so prepared for this new concept. That is, these teachers are not being well informed about this creative question in mathematics. Almost one-third (30%) of the teachers think that the creative question will be able to explore students' thinking ability in mathematics but before that the system need a modification like as distribution in marking. Only the one-tenth (10%) of the mathematics teachers think that by the creative questioning subject knowledge of the students will be increase. The another one-fifth (20%) teachers' perception is that the creative question will be a positive turning point in mathematics but it is not necessary to include the knowledge part in every set of question as because mathematics is basically an analysis based subject. The last one-fifth (20%) of the mathematics teachers perceive that when the creative question will be started in mathematics it will be helpful for both the teachers and the students. They think, the creative questions will be easy to evaluate for the teachers and it will help the students to get higher grade by answering easily than now.

4.2 Second Step: Mathematics Teachers' Perception about Creative Question (CQ)

a. Understanding about meaning of Creative Question:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of understanding to the question "What is creative question?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentages
Explore student's creativity	20%
Discover students' thinking ability	40%
Measure different levels of student's learning	40%

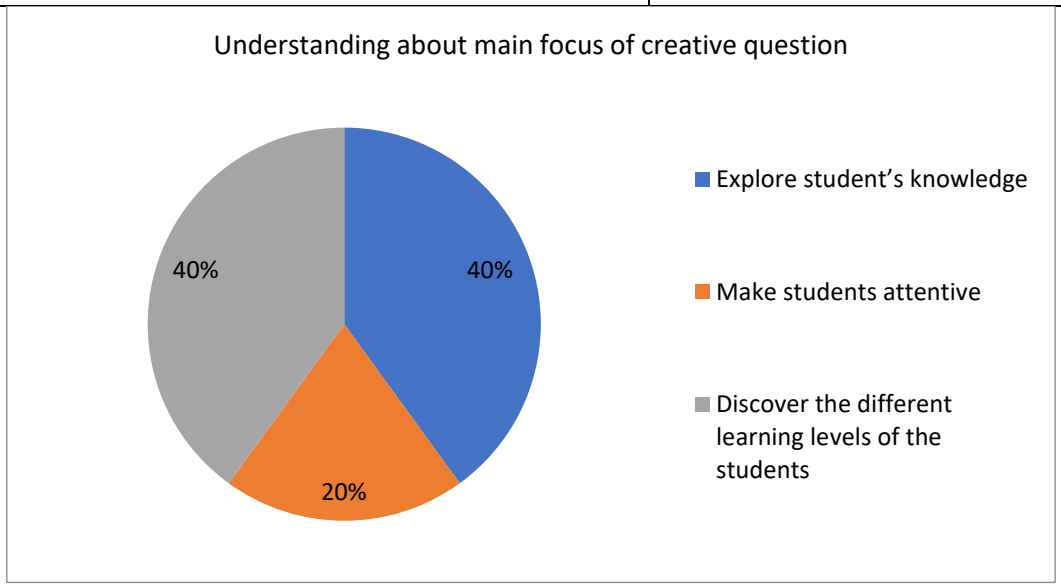


The figure represents that nearly half (40%) teachers perceive that creative question discovers students' thinking abilities and the other (40%) perceive that it measures different learning levels. One-fifth (20%) of them think that it explores students' creativity in different areas.

b. Understanding about main focus of Creative Question:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of understanding to the question "In your knowledge, what should be the main focus of creative question?". The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentages
Explore student's knowledge	40%
Make students attentive	20%
Discover the different learning levels of the students	40%

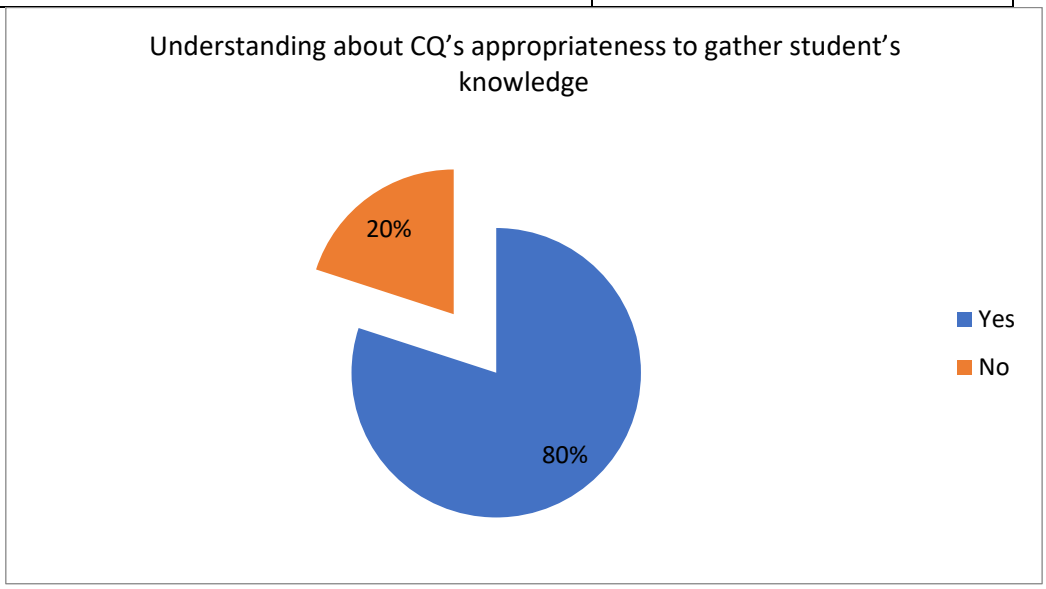


The figure represents that by giving their conceptual thinking I found 40% of the teachers think that the main focus of the creative question is to explore the student's knowledge. That is the creative question should be done by focusing if that it can explore the knowledge of the student's properly. The other 40% teachers are thinking that the main focus of the creative question should be to discovered the different learning abilities of the students. That is the teacher can easily measure the student's learning in the different levels that it may satisfied or not. A very little part of the teachers (20%) are giving their opinion that the creative question should delivered in such a way for which the students are being attentive to answer it.

c. CQ's appropriateness to organize student's knowledge:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of understanding to the question "Do you think that the creative questioning concept is appropriate to organize student's knowledge?". The total outcome of the teachers about this statement is shown below in figure 4.2.3 and interpreted after that.

Concepts	Percentage
Yes	80%
No	20%

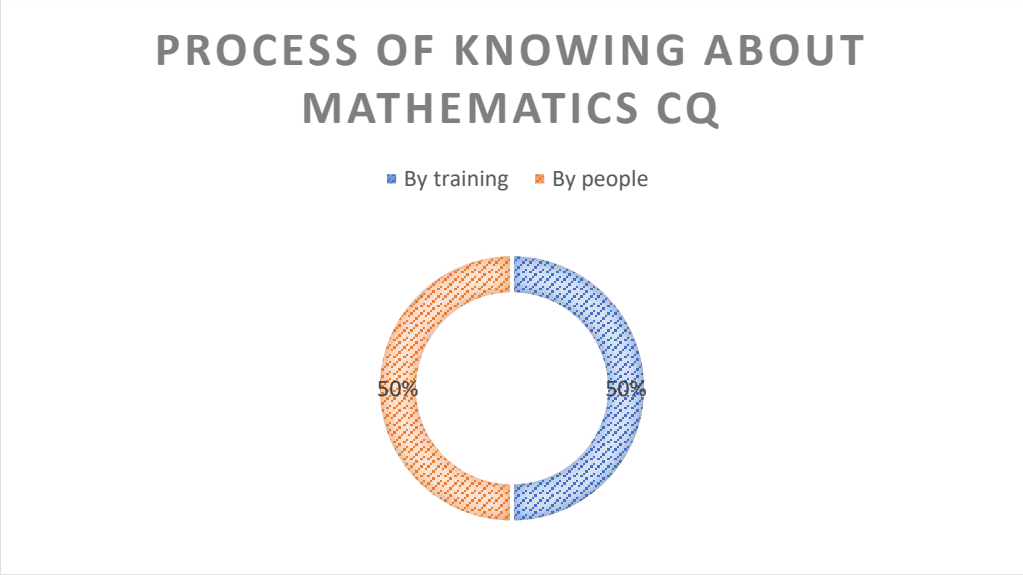


The figure represents that most of the teachers (80%) perceive that creative question is appropriate to gather the student's knowledge. They think existing system can gather the subject knowledge of the students. But just one-fifth (20%) of the teachers perceive that if we want to apply such a question to gather student's subject knowledge then we have to make such questions which will give the opportunity to thinking. The existing questions are not enough to gather the knowledge of the students.

d. Process of knowing about mathematics CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of understanding to the question "How could you know about the mathematics creative questions?". The total outcome of the teachers about this statement is shown below in figure 4.2.5 and interpreted after that.

Concepts	Percentage
By training	50%
By people	50%

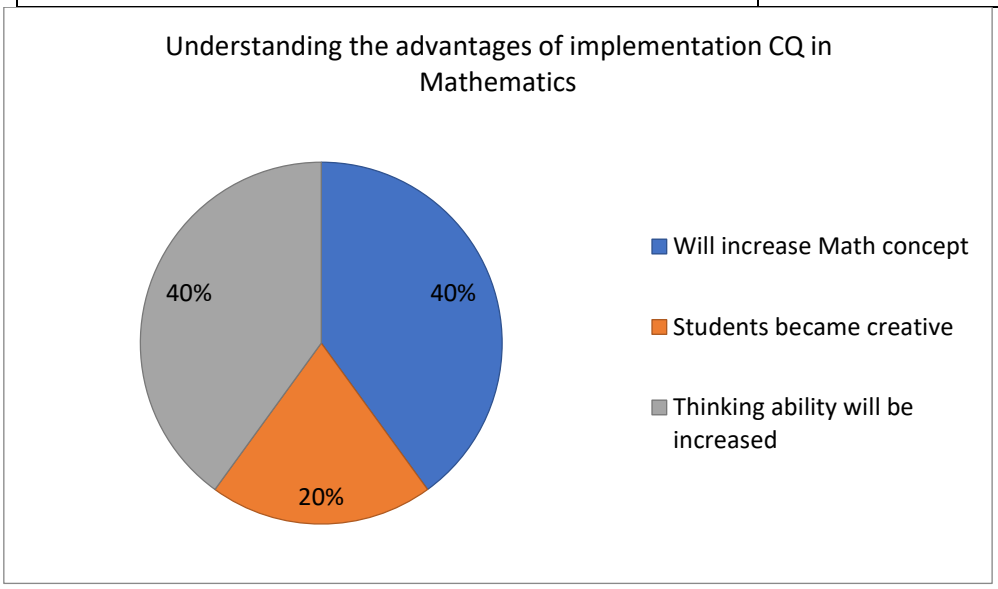


The figure represents that the teachers who are being informed, among them half of the teachers know about this creative system in mathematics by doing training. That means the teachers participated in the creative question training of mathematics and so being informed about this concept. The other half of the teachers who are informed about the concept they still have no training on it. They just being informed by people's voice that such a system is going to applied in mathematics.

e. Understanding the advantages of implementation CQ in mathematics:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of understanding to the question "What will be the advantages to implementing the creative question concept in mathematics?". The total outcome of the teachers about this statement is shown below in figure 4.2.6 and interpreted after that.

Concepts	Percentage
Will increase Math concept	40%
Students became creative	20%
Thinking ability will be increased	40%



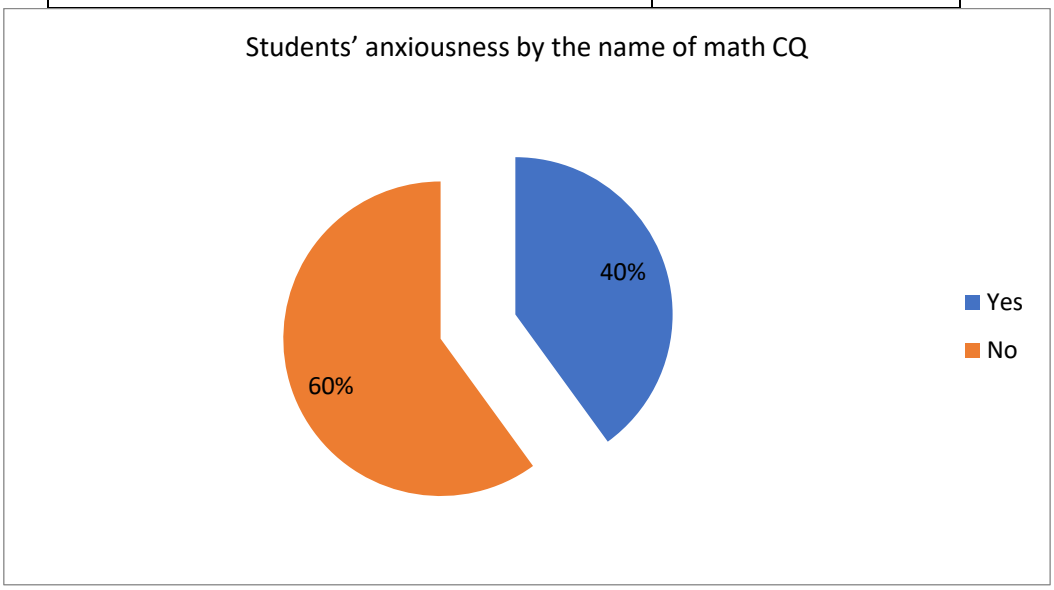
The figure represents that in the question of about the advantages of creative question by the implementation of creative question in Mathematics, near about half of the teachers (40%) think that this type of questioning will increase the concept of the students in Mathematics. Because they have to do proper analysis to answer those questions. The one-fifth portion (20%) of the teachers think that the main advantage is to make the students creative. That is creative question will make students creative enough to solve the problems. Rest of the teachers (40%) think that creative question can improve the

thinking ability of the students. That is this type of concept can easily motivate the students to increase their thinking ability instead of memorization or doing the solution without proper understanding.

f. Students' anxiousness by the name of math CQ:

Every twenty teachers, who have chosen purposively, had given their opinions from own point of view of understanding to the question "Do you think that the students are becoming anxious by the name of 'creative question' in mathematics?" The total outcome of the teachers about this statement is shown below in figure and interpreted after that.

Concepts	Percentage
Yes	40%
No	60%



The figure represents that I asked the teachers whether the students are being anxious by the name of "Creative Question in Mathematics" or not. The less part of the teachers (40%) perceive that the students are not being informed about the context or the concept of the creative question. They are just being anxious of the name. But the greater part of the teachers (60%) thinks that there exist nothing so like this among the students.

4.3 Summary of the Result

The following tables present the summarized results of teacher responses:

Table 1 Teachers' Support for Creative Questioning

Response	Percentage
Yes	98%
No	2%

Table 2 Teachers' Perception of Students Creativity Improvement

Response	Percentage
Yes	95%
No	5%

Table 3 Perceived Barriers in Implementing Creative Questioning

Barrier	Percentage
Untrained Teachers	40%
No Barrier	20%
Timing & Marks Issues	40%

As shown above, while teachers largely support creative questioning and believe it can improve student creativity, they have identified several barriers including lack of training, insufficient practice opportunities, and systemic issues related to exam timing and marks distribution.

5. Major Findings

The analysis revealed near-unanimous support for creative questioning among teachers, who believe it enhances creativity, critical thinking, and knowledge organization. However, significant implementation challenges were identified.

Teachers' Expectations: 98% supported creative questioning at the higher secondary level. Nearly 95% believed it enhances student creativity. However, they identified deficiencies in teacher training (30%), insufficient practice (30%), poor textbook quality (20%), and systemic limitations (20%).

Assessment Issues: Teachers were divided over the appropriateness of exam timing (60% said adequate, 40% said inadequate) and marks distribution (50% approval, 50% disapproval). A majority (70%) expressed concerns about the reliability of mathematics creative questions under the current system.

Barriers: The most frequently cited barriers were untrained teachers (40%) and inappropriate time and marks distribution (40%). Teachers unanimously (100%) demanded that grassroots mathematics teachers' voices be considered in future reforms.

Perceptions: Teachers largely defined creative questioning as a means of discovering students' thinking ability (40%) and measuring different levels of learning (40%). They also identified advantages such as enhanced conceptual understanding (40%) and improved problem-solving skills (40%). Yet, 40% reported that students displayed anxiety when confronted with creative questions in mathematics.

6. Discussion

The findings reveal a paradox: while teachers recognize the potential of creative questioning to foster creativity and problem-solving, systemic shortcomings hinder its effectiveness. A lack of adequate training, coupled with poor quality textbooks and insufficient practice opportunities, has created barriers to successful implementation. The results are consistent with global experiences, where successful implementation required robust teacher preparation and strong systemic support (Gordon, 2013; Hattie, 2009).

This study also highlights tensions between top-down policy directives and classroom realities. While the Ministry of Education and the Bangladesh Examination Development Unit have promoted creative questioning, grassroots teachers often feel excluded from the decision-making process. Without integrating teachers' feedback, reforms risk superficial adoption that fails to improve actual learning outcomes. Additionally, inequities between urban and rural institutions exacerbate disparities, making creative questioning more feasible for resource-rich schools than for under-resourced ones.

7. Conclusion

Creative questioning represents a promising reform in Bangladesh's mathematics education, aiming to foster critical thinking and reduce reliance on rote memorization. Teachers overwhelmingly support the initiative and acknowledge its potential benefits. However, the lack of robust teacher training, poor textbook quality, insufficient practice opportunities, and rigid systemic structures undermine its success. The study underscores the urgent need for policy interventions that prioritize teacher empowerment, curriculum reform, and inclusive policymaking. Unless these systemic issues are addressed, creative questioning may risk becoming a superficial reform rather than a transformative one.

8. Recommendations

- Comprehensive Teacher Training: Implement mandatory, hands-on training workshops for mathematics teachers on designing and evaluating creative questions, incorporating real-world problem integration.
- Resource Development: Revise textbooks and provide digital supplements with diverse, creativity-stimulating problems and real-life applications.
- Curriculum Alignment: Ensure creative questioning aligns with outcome-based education frameworks and targets higher-order thinking skills.
- Grassroots Involvement: Institutionalize teacher feedback in policymaking to ensure classroom realities inform reform decisions.

- Continuous Monitoring: Pilot revised frameworks in select schools and track their long-term impact on student performance.
- Research Expansion: Conduct longitudinal studies and comparative regional analyses to better understand systemic gaps and opportunities.

References:

1. Amabile, T. M. (2012). Componential Theory of Creativity (Working Paper No. 12096). Retrived from http://www.hbs.edu/faculty/Publication%20Files/12-096.pdf
2. Cohen, D. K., & Hill, H. C. (2000). Instructional Policy and Classroom Performance: The Missing Link. The RAND Corporation.
3. Esquivel, G. B. (1995). Teacher behaviors that foster creativity. *Educational Psychology Review*, 7 (2) , 185-202
4. Gordon, S. P. (2013). Implementing Common Core Standards: Lessons Learned from the Field. Educational Leadership, 71(4), 44-49.
5. Hattie, J. (2009). Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement. Routledge.
6. Ministry of Education, Government of the People's Republic of Bangladesh (2010). *National Educational Policy 2010.* Dhaka. BD : Author.
7. National Council of Teachers of Mathematics (NCTM). (2014). Principles to Action: Ensuring Mathematical Success for All. NCTM.
8. Parker, C., & Neyland, D. (2019). Creative Learning and the Role of Questions in Education: A Review of the Literature. Journal of Educational Research, 112(2), 105-115.
9. Rahman, M. (2020). Exploring the Impact of Cultural Context on Teaching Practices in Bangladesh. International Journal of Educational Development, 75, 102129.
10. Stein, M. K., & Lane, S. (1996). Instructional Practices in Reform Mathematics Classrooms. In J. T. Sowder, & B. P. Schappelle (Eds.), Establishing Foundations for Tenure Track Teachers: A Research Report. Mathematics Education Research Group.