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Fostering Epistemic Curiosity in School Children by Instructional Teaching Design: Classroom Realities of Indian Schools

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ABSTRACT

The study attempted to answer two basic questions of classroom teaching: a. what were the most common teaching practices at the elementary school level? And b. did teachers foster curiosity in children during teaching? Classroom proceedings enfolded various teaching activities that might lead to a knowledge gap in students. 137 primary and middle schools (altogether 411 classes) were randomly selected to measure a pattern of questioning and answering during classroom teaching. Findings revealed that a large number of teachers adopted lecturing followed by writing on the board, dictating, and ignored some important teaching techniques such as explaining, demonstrating, and experimentation; though they were familiar with all these. Hardly any student asked questions to the teachers. Teachers missed to generate a gap of knowledge in them, showing hardly any use of curiosity-led instructional teaching design. Throwing any question to class or a group of students was an unplanned teaching behaviour. It was a limitation of an in-built education system that prioritised rote learning, exam scores, and grades that measured more static knowledge rather than understanding knowledge. The findings discussed limitations of the in-built education system and mindset of teachers that discouraged epistemic curiosity in children.

1. Introduction

The study was designed to ascertain whether classroom teaching practices had an edge to foster epistemic curiosity in school children. Fostering epistemic curiosity in children could be assessed by a pattern of questioning and answering generated during classroom transaction. The study aimed at identifying various teaching methods adopted by teachers and a pattern of questioning and answering during classroom transaction that could be a significant indicator of epistemic curiosity. Epistemic curiosity is the desire to obtain new knowledge capable of either producing positive experiences of intellectual interest or of reducing undesirable conditions of informational deprivation (Piotrowski, Litman & Valkenburg, 2014)

The presumption was that teachers received a plethora of teaching inputs during trainings at various stages to promote the epistemic curiosity of children. They were expected to apply curiosity-led instructional strategy to classroom teaching. The New Education Policy of India (2020) lays emphasis on holistic development of learners focussing on "learning how to learn"-away from the culture of rote learning and provides more space for critical thinking with the help of exploratory, collaborative and experiential learning. The National Curriculum Framework (2005) outlines many strategies to teaching that are relevant for stimulating curiosity in children. "Learning how to learn" is possible when teachers promote epistemic curiosity by selecting an appropriate instructional design of teaching. The study was undertaken with a presumption that teachers adopted a curiosity-led instructional strategy to the classroom situation.

Curiosity is a multifaceted cognitive construct. Behavioural researchers treat curiosity as an antecedent variable that leads to learning and performance while many others use it as an outcome variable that results from classroom climate and instructional methods (Kashdan et al., 2018). Another group of researchers argue that curiosity is a mediating variable which finally influences learning outcomes (Jirout, Vitiello & Zumbrunn, 2018). This intricacy has resulted in

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ambiguity while fencing the boundary of the construct of curiosity. Promoting curiosity in children during classroom teaching demands careful planning and execution according to subject and grade. Teachers know when to create uncertainty (knowledge gap) and when to use the rote learning technique. Sometimes, they use simultaneously both techniques to handle the classroom proceedings. The optimal level of uncertainty varies according to grade and subject (Jirout & Klahr, 2012). On the continuum of curiosity, not all students experience the same level of learning challenges and are ready to take the same risks in resolving them. Previous researches explain that the intensity of curiosity decreases as students go to higher classes (Engel, 2013; Jirout & Klahr, 2012). This may result from an inherent deficit of the educational system which still gives weightage to rote learning. It was one of the reasons to notice more surface and strategic learners and less deep learners in the Indian education system (Singh, 2017). Performance-oriented students avoided risk failure and were found to be less curious (Hulme, Green & Ladd, 2013). According to e-learning survey, only 23 per cent students spent time enhancing their knowledge on smart phones or tablet computers (BEPC, 2020). Instead of e-learning platforms, games and cartoons were dearer to them. Pedagogues admit that there is no substitute for off-line learning (Jirout, Vitiello & Zumbrunn, 2018). To promote critical thinking teachers need to provide scaffolding for their students and respond to questions generated by them during classroom proceedings.

Previous studies on classroom proceedings in India traced a few examples of curiosity-led instructional design used by teachers (Singh, 2006; Singh, 2009). Teachers are expected to create some elements of challenges during classroom proceedings. Previous researches disclosed that teachers could hardly encourage their students to participate in exploratory and experiential learning processes. Researches in the West (Hulme, Green & Ladd, 2013) revealed that promoting curiosity in classrooms was effective only for a few learners. A robust instructional teaching design embodies a learning environment that helps increase preference for and comfort with a greater level of uncertainty. Classroom proceedings studies in India (Clark, 2000; Saraswati, 2000; Singh, 2006) suggested that teachers did not exercise curiosity-led practices in the classroom which they learnt during the District Primary Education Programme (DPEP-III). They theoretically admitted the usefulness of curiosity-led instructional strategy to learning but experienced many constraints to apply it to a crowded classroom (Singh, 2009).

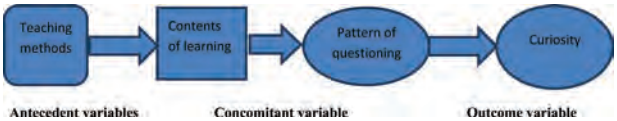
What are the constraints of curiosity-led teaching practices in India? The Indian schooling system evaluates students' academic achievement based on performance metrics. The quantitative scores get precedence over the critical thinking, explorative and collaborative abilities of learners. The schooling system recognises score cards of performance metrics and largely ignores the unseen talents of children. Learners do not find sufficient space to reflect their skills and competence in the right direction as the teacher-centric instructional design does not allow them to be critical during learning processes. Researches in India further confirmed that teachers did not incline to all students in the classroom proceedings. Classroom observations at Delhi schools showed that teachers initiated more interaction with boys, giving more time to answer any question, nodding towards them, looking at their side while teaching (Tulsyan, 2021). Throwing questions or expecting answers from their favourite were some of the common practices of classroom proceedings (Singh, 2006). They had a choice of a small group of learners during interaction in the classroom. Performance-oriented goals make students more strategic learners while mastery-oriented goals more deep learners (Grant & Dweck, 2003; Pintrich, 2003; Singh, 2017). Students have a mindset either to perform or probe in a challenging situation. Learning becomes a means to an end rather than the goal itself when they perform. An effective instructional teaching design can serve both the goals and means of learning by fostering an optimal level of uncertainty (level of challenges). Based on a few indicators of curiosity the study focused on twin core objectives:

1. To identify various teaching styles that lead to epistemic curiosity
2. To ascertain a pattern of questioning and answering generated during classroom transaction.

2. Conceptual Linkages to Variables

There could not be a single teaching strategy to foster curiosity in children. Previous studies established a fact that during classroom transaction teachers adopted various teaching methods-asking many questions and

thereafter, expecting answers from their students (Singh, 2009). Even students threw many questions to their teachers to bridge a gap of knowledge. Some indicators such as questioning, involvement in classroom activity, teachers' response to questioning, etc. were behaviourally observed to estimate the level of epistemic curiosity in learners. There have been numerous studies on the use of questioning as a strategy for teaching and learning. (Albergaria-Almeida, 2010; Chin & Osborne, 2008; Graesser & Olde, 2003). Teachers employed questioning to stimulate epistemic curiosity in students. The pattern of questioning was presumed to be one of the significant indicators of curiosity.



3. Research Questions

The study adopted a qualitative approach to capture some behavioural indicators of epistemic curiosity. Classroom proceedings constituted multiple dimensions ranging from teaching methods to other practices. A set of two independent stakeholders-teachers and learners were taken into consideration for observation. There would be a behavioural reflection on the pattern of inquiring and replying if curiosity-led instructional teaching design develops epistemic curiosity in learners. A few research questions were framed to capture epistemic curiosity in learners during classroom transaction. They were as follows:

1. Did teachers employ any specific technique to foster epistemic curiosity in children during classroom transaction?
2. Was there any pattern of questioning and answering during classroom transaction?
3. Did students ask questions during classroom transaction and get answers from their teachers?

4. Method

4.1. The Setting and Coverage

The study was conducted on the government-run schools in an eastern state of India covering 137 middle schools and 411 classrooms of grades 3, 5 and 8. It was a multi-stage sampling design covering 12 districts of 9 divisions. At the second level, 12 Block Resource Centres (BRCs) were selected. At the third level, 12 Cluster Resource Centres (CRCs) were chosen, each from a BRC, to cover all schools within each CRC. At the fourth level, 411 classrooms from various grades were chosen for observation and audio-recording of classroom proceedings. The sample units selected at each level followed Standard Operating Procedure (SOP).

4.2. Classroom Observation Checklist

A classroom observation checklist comprising teaching styles, planning of lesson, initiation and closing of classes, activities and questioning across grade and subject was developed with the help of a panel of experts. The checklist was tested in three different schools. The checklist captured the behaviour of both the stakeholders- teachers and students across grade and subject. Indicators of classroom proceedings were quantified. Field Investigators were requested to record each activity shown either by teachers or students on each parameter. These were transcribed to measure each parameter applicable to the classroom transaction. At least 20 per cent of classes of each subject were audio-recorded. These audio-tape recordings were content-analysed to cross-verify the observational reports. If any discrepancy between audio-recording and observational reports existed, the team corrected the anomaly.

4.3. Procedure

The entire classroom proceedings of a slot of 40 minutes allotted to each period were observed and transcribed. A fair number of them were audio-taped and were subjected to content-analysis. A team of two well-trained Field Investigators for each school was constituted to capture classroom proceedings. Teachers were ensured that the entire classroom proceedings would be recorded only for research purposes. They were requested to follow their common teaching practices in the classrooms. This arrangement was made in such a way that three observations of each school would cover three separate classroom proceedings of three subjects-languages, mathematics, and environmental science/social science by following a counterbalancing design. The data collection work was completed by the end of 2020.

4.4. Scoring

The classroom proceedings were measured using indicators that included two primary dimensions:

instructional approaches and questioning. Each activity was recorded and transcribed into the score. To neutralise biases in observation audio-tape contents were analysed. If required, a necessary modification was made to the score. In a few cases, some judgemental errors were noted by the observers (<5 per cent). These errors were modified with the help of audio-tape content. Questioning by the stakeholders (students and teachers) was one of the significant indicators of curiosity.

5. Results

Grade Wise and Subject Wise Teaching Method

Teachers opted for their way to handle the classroom situation which might or might not be a copybook prescription. Teachers' way of conducting the classroom proceedings were not supposed to be predetermined categories of teaching styles as suggested by pedagogues. Teaching styles are presented in Table 1. Lecturing continued to dominate over other teaching methods across grades (about 27 per cent). Teachers not only assigned some tasks to students but also guided them during classroom transaction (about 12 per cent). They also kept engaging learners by adopting recitation technique (13 per cent), if required. This technique restricted students to ask questions. Writing on the board was a popular technique to explain learning contents. Simultaneously, they dictated learners at primary classes (7 per cent). They often demonstrated some materials especially in grade 8. The study noted a few pieces of evidence of experimentation in grades 5 and 8. Interestingly, teachers moved out of classes to attend an adjoining class for some reasons. They left classes by instructing learners to complete the assignments until they returned. It happened because of handling dual classes in absence of a teacher in another class. There existed a few occasions when teachers made the topic more interesting by using storytelling mode. It was to some extent visible in class VIII (5.72 per cent).

Table 1: Grade wise and Subject wise Teaching Style.

	Grade wise action time in minute			Subject wise action time in minute		
Style	**III**	**V**	**VIII**	**Lang**	**Math**	**EVS/SS**
Lecturing	7.72 (25.73)	7.89 (26.23)	8.75 (29.16)	8.26 (27.53)	2.18 (7.26)	9.17 (30.56)
Telling	1.45 (4.83)	--	1.72 (5.73)	1.16 (3.86)	--	1.75 (5.83)
Demonstration	1.42 (4.73)	1.62 (5.40)	2.29 (7.60)	1.65 (5.50)	1.16 (3.86)	1.47 (4.90)
Dictation	2.07 (6.90)	2.15 (7.16)	1.15 (3.83)	2.26 (7.53)	--	--
Writing on board	3.67 (12.23)	3.08 (10.26)	3.85 (12.83)	3.52 (11.73)	8.10 (27.00)	3.21 (10.70)
Using activity	1.89 (6.30)	1.17 (3.90)	--	1.69 (5.63)	3.05 (10.16)	1.77 (5.90)
Engaged by learners' recitation	3.82 (12.73)	3.42 (11.40)	2.23 (7.43)	3.34 (11.13)	--	1.54 (5.13)
Guided class assignment	4.22 (14.06)	3.72 (12.40)	2.78 (9.26)	4.11 (13.70)	7.27 (24.23)	2.46 (8.20)
Unguided class assignment	1.96 (6.53)	2.77 (9.23)	4.77 (15.90)	2.46 (6.86)	4.39 (14.63)	4.05 (13.50)
Dialogue	--	--	--	--	1.19 (3.96)	1.79 (5.96)
Experimentation	--	1.11 (3.70)	1.28 (4.26)	--	--	1.59 (5.30)
Moving out from the class	1.78 (5.93)	1.26 (4.20)	1.19 (3.96)	1.95 (6.50)	2.65 (8.83)	1.19 (3.96)

Note: *Figure in parenthesis displays percentage*

Subject-wise classroom transaction was an exercise to draw some conclusions on fostering curiosity in a particular subject/topic. In the case of language and environmental science/social science (grade 8) lecturing again established its dominance over other techniques. However for mathematics, it was not a popular practice (7 per cent). Writing on the board was a common technique to explain the intricacy of mathematics (27 per cent).

Teachers were found to help individual learners more in mathematics and guiding them to resolve problems (24 per cent) as compared to language and Environmental Science/Social Science. However, the cases of unguided assignments (did not attend individual learners) were also evident in the study (about 14 per cent). Dictation was a common teaching practice in the language (7 per cent). A fewer evidences of experimentation were noted (5 per cent) in the case of EVS/SS. Similarly, the use of demonstration was negligible in all subjects. Evidences of narrating the topic like a storyteller and making it more interesting were visible in the case of language and EVS/SS (about 6 per cent).

Teaching styles did not significantly vary in accordance with grade and subject. The expectation that learners would experience more activities and demonstrations and less lecturing did not get supportive evidences. That learners were given role assignments or were left to fend for themselves for a considerable period of time was not just a reflection of ignorance of training inputs but also of the realities of classroom in the government-run schools. Partly because of continued insensitivity to the new expectations and partly because of a mindset, teachers preferred to adopt a traditional mode of teaching. This was a general view of teacher in classrooms. The classroom proceedings further explored evidences of lesson planning and preparation. The study noted that teachers had no forward planning of lessons across grades (about 65 per cent). Even learners had no idea of the subject or topic scheduled to be taught. Though teachers kept claiming of preparing lesson plans, no evidence to support their claims was noted. Not preparing the lesson plan was also substantiated by the fact that teachers changed the topic or even the subject midway (for instance, from mathematics to EVS). Nevertheless, around 49 per cent of teachers across grades prepared their topics and organised their lectures to be delivered. A well-delivered lecture did not always mean prior planning, as teachers chose topics with which they were more familiar, even if it had been addressed in the earlier sessions. The presence of observers most likely made them extra cautious to perform better than usual. In some cases, it disrupted teacher's design of instruction and classroom transaction. Surprisingly, teachers did not have their own set of textbooks. In many cases (57 per cent) they took textbooks from learners before teaching. Over 54 per cent of classes of all three grades did not match the routine when verified.

Initiation and Closing of the Classes

Table 2 shows a pattern of initiation and closing of classes. This analysis was done in view of drawing some inferences about handling the classes. The presumption was that initiation and closing of classes ensured learners' involvement in classroom learning. Without any prior knowledge, teachers jumped right into the subject. In grade 8, it was about 71 per cent. Hardly a few teachers felt a need to check the previous knowledge which they had given to them. A few teachers initiated the classes either with sufficient background (13-27 per cent) or narrated a relevant story/event (4-17 per cent). The majority of the classes abruptly ended (36-54 per cent). Recapitulating and evaluating the topic before closing of the classes were least visible. However, assigning homework to them was evident before closing of the classes.

Table 2: Initiation and closing of Class (%).

Initiation	Grade		
	III	V	VIII
With sufficient background	26.52	22.72	13.42
Narrating a story or event	17.25	14.38	4.20
Checking the previous knowledge	8.24	8.29	11.65
Directly on the topic	47.97	54.61	70.73
Closing			
Recapitulating	22.43	14.58	12.72
Evaluating	17.27	13.66	14.57
Assigning task	23.75	17.28	26.62
Winding up abruptly	36.55	54.48	46.09

Learners' Activity during Classroom Transaction

Child-centred teaching remains incomplete without ensuring activity to be performed by learners. Many teachers refused to participate in activities that had additional meaning, such as singing and dancing. Although children enjoyed them, many people believed that such activities killed learning time. Such misconceptions coupled with lack of motivation resulted in rare presence of any kind of activity in teaching design. A frequency count suggested that only 47 activities out of around 411 classrooms observations. Of them, 27 activities could take place in grade 3. Only 6 activities were found in grade 8. In

grade 3 around 41 per cent of all learners were seen to be involved in activity. On the other side, only 26 per cent in grade 5 and 15 per cent in grade 8 of the entire class showed their involvement. Over 60 per cent learners of the entire class in both grade 5 and 8 had no involvement in activities initiated by teachers. Another noteworthy pattern of data was discovered while analysing the relevance, participation, and learning output of the exercise. Many of the activities in each grade were, in fact, irrelevant. As a result, over 60 per cent activities did not help them learn in grade 3 and 5. Even activities did not ensure participation of learners in all grades.

Questioning and Answering Pattern during Classroom Teaching

The way teachers managed classroom transaction might establish a linkage to curiosity in learners. This could be presumed by a pattern of questioning and its interface with learners. The study counted every question separately asked by teachers and learners during classroom transaction and analysed from different angles. Table 3-6 present pattern of questioning. Over 50 per cent of questions in grade 3 and 5 and 36 per cent in grade 8 were directed to the entire class. In grade 8 about 59 per cent questions were directed to individual learners. A few questions were thrown to a particular group, namely, the front row students, gender specific or backbenchers. But teachers, by and large, showed their inclination to brighter students irrespective of gender. They did it to get the answer in presence of the observer. Preference of directing the questions to boys than girls was noted to be higher (59 per cent). In grade 3 and 5 they asked more questions from boys (69 per cent). However, questioning in grade 3 was almost equal both for boys and girls. Though there was a gender bias, teachers did it to elicit correct answer from them. Teachers kept waiting for the responses from students across grade (> 50 per cent). On a few occasions they did not wait for a response and instead responded. They answered questions without waiting for any response from learners (Table 4). While questioning during transaction about 50 per cent students of the entire class of grade 3 and 5 and about 40 per cent of grade 8 responded to their teachers (Table 5). However in grade 8 about 53 per cent individual students responded to questions.

Not all teachers had patience to wait for the answers by learners. Table 6 displays a situation when learners failed to answer or did not reply to teachers. Teachers dismissed the answer when found not correct across grade (about 22 per cent). They either corrected the answer (> 50 per cent) or elaborated it after a request by learners (about 25 per cent), reflecting their sensitiveness to learners.

Further an analysis was done to ascertain grade wise pattern of questions asked by students. Students asked altogether 115 questions (22 from grade 3, 38 from grade 5 and 55 from grade 8). At the lower grade they asked fewer questions. In grade 8 the frequency of asking questions got increased. There existed significant variation in asking of questions by each class. Questioning by all across grades did not go beyond 27 per cent. Percentage of asking questions by a few learners radiated between 25 and 42. About 50 per cent individual learners of grade 3 and 47 per cent of grade 8 asked questions during classroom transaction. The remaining class kept listening to teachers. Gender wise analysis disclosed that there existed least variation in asking questions about the topic. 58 per cent boys from grade 5 raised question which was higher than their counterpart (43 per cent).

Table 3: Questioning by Teachers (%).

Questioning	Grade		
	III	V	VIII
Entire class	55.25	51.72	36.42
A-group	4.37	7.28	4.97
An individual	40.38	41.00	58.81

Table 4: Response Pattern of Teachers (%).

Teacher	Grade		
	III	V	VIII
Waited for the response	57.36	54.29	55.42
Did not wait for the response	17.24	18.38	21.22
Herself/himself answered	25.40	27.33	23.36

Table 5: Response Pattern of Learners (%).

Learners	Grade		
	III	V	VIII
Entire class	50.12	47.36	40.43
A-group	9.29	7.29	6.22
An individual	40.59	45.35	53.35

Table 6: Teachers' Response to Answers (%).

Teachers	Grade		
	III	V	VIII
Dismissed the answer	21.36	22.16	24.26
Corrected the answer	60.67	52.41	50.28
Requested to elaborate the answer	17.97	25.43	25.46

Discussion

The study attempted to capture some behavioural pattern of curiosity in learners during classroom proceedings. Curiosity was assessed through questioning and its answering pattern during classroom transaction. A live interaction between teachers and learners helped estimate the level of curiosity in learners. Though a slot of 40 minutes was not sufficient to estimate curiosity of learners, teachers made some attempts to create a learning situation for fostering curiosity in them. Also, the respondents had a tendency to respond or behave in a socially desirable way in any survey especially when a set of observers were present during the running classes. The study admitted its limitations and constraints of observational rating technique. The analysis of classroom proceedings made it obvious that by and large, teachers were not capable of promoting the curiosity-led learning environment in the classroom. A large number of teachers kept practising lecturing followed by writing on the board, assigning tasks, dictating, reciting. Demonstration and experimentation required planning and preparation of the topic. Teachers did not give priority to such techniques. As a result, teacher-centric classroom proceedings made classes passive and monotonous.

It also was evident that not all students, regardless of grade or subject, shared the same amount of curiosity. Even within the subject not all topics could generate critical thinking and questioning. It was contingent upon teacher's ability to assign some tasks to them for self-questioning or design some group activities for generating curiosity in the topic. The study did not find a significant pattern of questioning and answering from both teachers and students. Teachers continued floating more questioning to the entire class especially in grade 3 and 5 and less in grade 8(36 per cent). It was a tendency to ask some general questions from the entire class and to answer it while teaching. Teachers did not wait for the answer from them. They asked very few questions from a particular group (about 4-7 per cent) and focused more on an individual learner. Teachers moved to a particular learner to ensure correct answer of the question while teaching. Questioning directed to the entire class did not go beyond 24 per cent. A group of students was found questioning more at the primary level. However, a few individual learners kept questioning more. Teachers had no time to initiate any group activity. They kept engaging classes without any stimulation to create a gap of knowledge in learners.

Engaging classes and fostering curiosity are two different phenomena. An engaged student may be or may not be curious in the topic to be taught. Curiosity does not require any forced engagement. Engagement was more than paying attention but did not demand an empowered learner forging into new ideas with an open-mind through inquiry and questioning. The study did not get any significant evidence of teaching style which could establish a direct linkage to questioning. Other than mathematics lecturing was a prominent technique for both language and social science. Teachers elicited and supplied factual information in a fairly routine manner. They provided corrective feedback to students but did not provide extra time to puzzle their way through to the right answer. Another alternative solution was to initiate activity with questions which encouraged students to think of actions rather than answers. Direct instruction was found to be effective in teaching specific facts or bits of information while deeper learning came from students' deriving the facts and information themselves. The second option known as child-centric classroom proceedings required planning and preparation for creating an uncertainty or a knowledge gap in learners (Jirout, Vitiello & Zumbrunn, 2018). There existed no substantive evidences of planning and preparation of lessons by teachers before engaging classes (Tulsyan, 2021). Teachers entered the class without any lesson plan and in most cases without any textbook. Many activities during classroom transaction were indeed, not relevant. Over 60 per cent activities initiated by teachers did not help students learn in grade 3 and 5. Even such activities did not ensure participation of learners across grade.

Questioning either by teachers or students during teaching gave a meaningful pattern. Questioning can be an extraordinary tool of learning. A good

question if asked by students reflects the level of curiosity that consolidates the level of understanding. A student's ability to answer question is always appreciated, but more important phenomenon is to ask relevant questions at their own level and seek a comfortable solution of it. It is possible, when a student gets optimum level of dissonance during classroom transaction. But how do teachers create such optimum level of dissonance in them? It is a challenge of instructional design. Teachers asked questions during teaching but showed their biasness to the brighter students in order to ensure correct answers from them. They were extra cautious while teaching and hence, showed their best performance during observation. In many cases they taught the old units which they had already covered earlier. Many teachers were found delivering wrong concepts to learners and a large number had serious problems of articulation. Many of them had problems in pronunciation and accent. Teachers did not find it necessary to read instructions given at the beginning of the textbooks. Some teachers could not recall the number of units of a textbook. The newly recruited mostly young teachers were less professionally competent to manage classroom transaction. They could only somehow learn to manage classes (Sinha, Banerji & Wadhwa, 2016).

Two important dimensions of curiosity need to be discerned, namely, joyous experience and deprivation sensitivity. A student is curious when she/he copes with distress that arises from exploring the novel situation. The study did not find any evidence of the need for exploration by learners. While answering questions teachers did not allow adequate time to think of the situation. They either dismissed the answer or corrected the answer. Students had less space to ask questions in the class. They kept listening to their teachers. When asked any question by students, it did go either unattended or discouraged. The analysis revealed that teachers did not use curiosity-promoting instructional design to the level that was expected. It was most likely a limitation of in-built education system, which prioritised rote learning, exam score and grades that measured for more static knowledge and less understanding knowledge. The in-built education system is based on performance in the exam that makes students less curious (Hulme, Green & Ladd, 2013). Of late, the blended learning is more encouraged to customize learning experiences. It is yet to witness how much digital technology has benefitted students of the government-run schools. "Digital education cannot substitute for real learning (off-line learning). Teachers feel trapped and enslaved to a system that encourages coaching not teaching. The entire process is disconcerting. Students learn more from each other while engaging in challenging and collective tasks. Staring at a screen or blackboard, learners do not think, question, argue, discuss but only act as remote receptors of what is beamed. Learning by technology cannot ensure curiosity in learners. IT industry cannot be a substitute for teachers. Curiosity requires some group activities and meaningful work. Education is not about competence but more about motivation (Rampal, 2021, p.22)". "Education is not just about delivering lessons or filling worksheets, perhaps more about teacher-student interactions, peer interplay and an experience of a school life which supports development of a range of skills, competencies, and attitudes (Tulsyan, 2021, p.23)". The findings also reveal that teachers need to create optimum levels of uncertainty in students and allow them to gain self-learning experiences without any fear of being wrong.

Summary and Conclusions

There were a few examples of curiosity-led teaching strategies for students. Teachers adopted rote learning method to enhance performance of learners and expected factual answer from them. Asking questions from their students across class and subject was an unplanned teaching behaviour. Teachers waited for responses in many cases and finally, answered the questions and often elaborated or corrected the answer, if found wrong. Teachers received answers mostly by a few students and not by the entire class. Hardly any student had asked questions during classroom transaction. Teachers did not provide extra time for students to puzzle their way to the right answer. Deep learning will occur and innovative ideas will emerge in the young mind if teachers initiate some activities with questions rather than seeking a correct answer and model their own inquisitiveness for the children, praising youngsters for their actions rather than answers.

Implication

The study proposed two avenues for promoting epistemic curiosity in classrooms: a. Create learning experiences most likely to ignite epistemic curiosity by creating optimal levels of uncertainty and b. Assist students in becoming more curious by increasing their preference for and comfort with greater levels of uncertainty. Curiosity leads to the exploration of uncertainty and the acquisition of new information, and can support students in facing challenges and taking intellectual risk. Despite this, curiosity decreases with formal schooling, perhaps resulting from a lack of alignment between the current educational system and curiosity. Performance outcomes measuring static knowledge are still a valid criterion of academic success.

References

Albergaria-Almeida, P. (2010). Classroom Questioning: Teacher's Perception and Practices. *Procedia - Social and Behavioural Science*, *2*(2), 305-309. https://doi.org/10.1016/j.sbspro.2010.03.015

Bihar Education Project Council (2020). Uses of Digital Platform. *Unpublished Document*, Patna.

Chin, C., & Osborne, J. (2008). Students' Questions: A Potential Resource for Teaching and Learning Science. *Studies in Science Education*, *44*(1), 1-39. https://doi.org/10.1080/03057260701828101

Clark, P. (2001). *Teaching and Learning: The Culture of Pedagogy*. Sage Publication: New Delhi.

Engel, S. (2013). The Case for Curiosity. *Educational Leadership*, *70*(5), 36-40.

Graesser, A. C., & Olde, B. A. (2003). How does one know whether a person understands a device? The quality of the questions the person asks when the device breaks down. *Journal of Educational Psychology*, *95*(3), 524–536. https://doi.org/10.1037/0022-0663.95.3.524

Grant, H., & Dweck, C. S. (2003). Clarifying Achievement Goals and Their Impact. *Journal of Personality and Social Psychology*, *85*(3), 541–553. https://doi.org/10.1037/0022-3514.85.3.541

Hulme, E., Green, D. T., & Ladd, K. S. (2013). Fostering Student Engagement by Cultivating Curiosity. *New Direction for Student Services*, *2013*(143), 53-64. https://doi.org/10.1002/ss.20060

Jirout, J. J., Vitiello, V. E., & Zumbrunn, S. K. (2018). Curiosity in Schools, In G. Gordon (ed.). *The New Science of Curiosity*, Nova Science Publication, Inc: USA.

Jirout, J., & Klahr, D. (2012). Children Scientific Curiosity: In Search of an Operational Definition of an Elusive Concept. *Development Review*, *32*(2), 125-160. https://doi.org/10.1016/j.dr.2012.04.002

Kashdan, T. B., Stiksma, M. C., Disabato, D. J., McKinght, P. E., Bekier, J., Kaji, J., & Lazarus, R. (2018). The Five Dimensional Curiosity Scale: Capturing the Bandwidth of Curiosity and Identifying Four Unique Ungroups of Curious People. *Journal of Research in Personality*, *73*, 130-149. https://doi.org/10.1016/j.jrp.2017.11.011

MHRD (2020). *New Education Policy,* Ministry of Human Resource and Development, Government of India: Delhi. Retrieved from: https://www.education.gov.in/en/nep-new

NCERT (2005). *National Curriculum Framework*. National Council of Education Research and Training, MHRD, Government of India: Delhi. Retrieved from: https://ncert.nic.in/pdf/nc-framework/nf2005-english.pdf

Pintrich, P. R. (2003). A Motivational Science Perspective on the Role of Student Motivation in Learning and Teaching Context. *Journal of Educational Psychology*, *95*(4), 667-686. https://doi.org/10.1037/0022-0663.95.4.667

Piotrowski, J. T., Litman, J. A., & Valkenburg, P. (2014). Measuring Epistemic Curiosity in Young Children. *Personality and Individual Differences, 60,* S8. https://doi.org/10.1016/j.paid.2013.07.173

Rampal, A. (2021, January 21). 'Digital education cannot substitute for real learning … Staring at a screen learners only act as remote receptors of what's beamed'. *Times of India*. Retrieved from: https://timesofindia.indiatimes.com/blogs/the-interviews-blog/digital-education-cannot-substitute-for-real-learning-staring-at-a-screen-learners-only-act-as-remote-receptors-of-whats-beamed/

Saraswati, P. (2000). A Report on Classroom Observation Study: Chithoor District (Andhra Pradesh). *Mimeograph*, National Education Council of Education Research and Training, GoI: Delhi.

Sinha, S., Banerji, R., & Wadhwa, W. (2016). *Teacher Performance in Bihar, India : Implications for Education*. World Bank Group, Washington: USA.

Singh, S. K., et al., (2006). Impact of In-Service Training of Teachers: The Experience of BEP (DPEP III). New Delhi : UNICEF. 103. http://www.educationforallinindia.com/research_abstratcs_on_education_NIPCCD_1998_to_2009.pdf

Singh, C. B. P. (2009). Classroom Proceedings in Primary Schools: An Appraisal Study. *The Social Engineer*, *12*(1-2), 65-77.

Singh, C. B. P. (2017). Multilevel Exclusion of Dalit Students in Professional Elite Colleges of India. *Social Change*, *47*(3), 359-372. https://doi.org/10.1177/0049085717712814

Tulsyan, A. (2021, January 22). Even When Textbooks Preach Gender Equality, the Hidden Curriculum at Schools Can Still Undermine Girls. *Times of India*. Retrieved from: https://timesofindia.indiatimes.com/blogs/toi-edit-page/even-when-textbooks-preach-gender-equality-the-hidden-curriculum-at-schools-can-still-undermine-girls/

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