

# The Benefits and Challenges of Shadow Education in Mathematics Learning

Namrata Srivastava<sup>1</sup>, Neerja Dhankar<sup>2</sup>

<sup>1</sup>Research scholar, Dept. of Education (UMU, Ranchi)

<sup>2</sup>Professor (Research), UMU, Ranchi

## Abstract:

Shadow education is known as the education which is given or received in the form of private tutoring at home or at some other place other than regular school. This has nowadays remarkable effects on the society and school going students. This has gained so much popularity that students want to join it so that they can gain some conceptual knowledge about the subject. In schools mathematics knowledge plays an important role in the growth and development of the child and so for the nation. There is a strong connection between the mathematics subject and shadow education. Mathematics is one way easy, simple, conceptual and practical but on the other hand for some it is just the opposite. The students and even many parents feel that it is hard, complicated and its language is different and also some chapters and topics of the higher classes are difficult to understand and of no use ever. It is said that everything has its good and bad aspects. So there are challenges associated with shadow education and mathematics education. Among all the subjects taught in schools, mathematics plays an important role in us. The data for this research was collected through interviews with the children who participated in shadow education for improvement and good scores in mathematics. The researcher applied a phenomenological approach for the study. There is an involvement of three students of class 10th grade waiting for class examination results, purposive sampling was used. Data collection was done keeping in mind that there is an impact on personal growth and gaining conceptual knowledge of mathematics, for personality development and also mental development. This study provides insights for educators, students and policy makers and parents. It aims to develop the needs and concerns of students who are engaged in shadow education.

**Keywords:** Shadow education, challenges, benefits, mathematics education, academic performance, mathematics competency.

## Introduction:

Shadow education is known as the education which is given or received in the form of private tutoring at home or at some other place other than school. Another name for shadow education is supplementary tutoring. Coaching will also come under shadow education. Shadow education has expanded its roots and branches everywhere where we live. It is actually related directly with students and their

advancement gaining conceptual knowledge. (Bray, 29; Mori and Baker, 2010) It has attracted the primary and secondary school children to improve academic achievement. This shadow education system is different from the normal school teaching and learning. Shadow education has been accepted as a global phenomenon. It is more popular in Asian countries. For example, in the Republic of Korea, nearly 90% of the elementary students receive some sort of shadow education. Similarly, in Hong Kong, China, about 85% of senior secondary students go to tuition centres whereas in West Bengal, India, the percentage of primary school students receiving shadow education is about 60%. From this data we can see how popular private tutoring is in other countries. Shadow education offers support outside of a regular school setting to foster students' learning outcomes and performance in particular subjects where they feel difficulty (Bray and Lykins, 2012). We can say 'private tutoring is a highly effective way to ensure academic excellence'.

Private tutoring also called "Shadow Education" is a growing industry in both developed and developing countries. In some countries in East Asia, private tutoring accounts for close to 3% of Gross Domestic Product (Dang and Rogers, 2008). Private supplementary tutoring in academic subjects outside school hours for remuneration is described as shadow because it mirrors the mainstream education system in its scope; intensity, size and orientation, and public attention in almost all societies are focused more on mainstream than on its shadow (Bray, 2006). Private tutoring is not a new phenomenon; some reference to it exists principally in the nineteenth century publications. In recent years, it has been growing steadily as a parallel education sector to the mainstream education system and with its growth, there exists an increasing body of literature examining its scope, causes and impacts on learning and livelihood. Private tuitions may have many positive effects, such as increasing human capital, providing constructive after-school activities for students, and generating additional income for tutors (often low paid teachers), it also produces and shows a number of negative effects. For example, private tutoring can lower the quality of education provided by the school system as teachers, who often tutor their own students, they focus more on their tutoring class rather than on their school classes. It has seen a rise in the thoughts of both the students and the parents to seek educational support beyond formal classrooms with the belief that they will gain a competitive edge and meet high academic scores. Shadow education shows its long history dating back to ancient times. It is especially with subjects like mathematics and science in which conceptual knowledge is needed to apply in the real world.

Mathematics is usually a gatekeeper subject in high-stakes examinations (Burkhardt, 2007; Wang & Guo., 2017) and therefore receives more attention in the shadow education market. With the rapid development of shadow education globally, the market needs more employees to join the tutoring trades, which brings a growing population of teachers working in shadow education, especially for mathematics. Major subjects that students face are in the subject of Science, Mathematics and English. Students go for private tuitions for the understanding of the concepts. This supplementary system of education has been studied in different contexts. There are many reasons observed and came into light about students opting for private tutoring in mathematics. Many students are intelligent so they want to polish themselves more for competitive platforms. Parents also want them to prepare for highly competitive examinations.

The increasing opportunities of getting private tuitions during the Industrial Revolution in the 18th and 19th centuries raised the demand for private tutoring in Europe. European aristocrats offering supplementary education to prepare students for highly competitive admission tests (Stevenson and Baker 1992).

## **Methodology:**

For this study, the researcher used interpretive phenomenology as a research method. This research aims to get students lived experiences when they are engaged in private tuitions for the mathematics subject. The design of the study was formed by Interpretative Phenomenological Analysis (IPA) including the three concepts of; phenomenology (the study of experience), hermeneutics (the theory of interpretation) and idiographic (a particular person making sense of their experience (Smith et al., 2009)). Phenomenology is the study of consciousness as experienced from the first person point of view. Focusing the philosophical theory of mind on intentionality, or mental representation, it lays a foundation for empirical studies of mind in cognitive science. The researcher collected the information about the benefits and also the challenges faced by them in learning mathematics. The three students were interviewed individually as they were engaged in tuition for mathematics learning. The researcher purposely selected the students and a place or the tuition centre from whom he can get the correct answer for the study. The researcher selected the students and the tuition centre from Birsa Nagar, a place in Jamshedpur. To understand the phenomenon of shadow education in mathematics and its benefits and challenges.

For in-depth, the researcher selected a nearby tuition centre and visited with a plan. After explaining about the aims and objectives to the private tutor. The researcher had an interaction with the students and the researcher explained to them about the purpose. I directly contacted them so that I could get the rich and relevant data.

The process began by visiting the tuition centre and observing. Tutor was also ready to give all the information. All information about students related to academics were collected. After interacting nicely with the tutor the researcher was ready for the interview. A semi-structured interview was conducted on the perspective of benefits and challenges in learning mathematics. The responses were saved as audio- recorded for further interpretation. Field notes during the interview were taken for any additional information. All information was kept confidentially and the same was assured to the participants and the tutor.

## **Interpretation and Presentation:**

After getting all the information, results and interpretation was done. The researcher applied the interpretive phenomenological analysis (IPA) framework developed by Smith et al. (2009) for the interpretation of qualitative data in this study. After many times of observation and reading the information, a number of times interpretation was done. Codes were given to the important points and then were converted into themes. Later the themes were revised and refined. To make findings more accurate and trustworthy, the researcher analysed the audio recording by carefully listening to the

information and reviewing the transcripts. Field note was always taken to maintain the accuracy and consistency.

### **Discussion:**

We know that many students suffer from Maths Phobia. Private tutoring helps a lot to remove this. The aim of this interpretative phenomenological study was to investigate and find the benefits and challenges of shadow education in mathematics education from students' perspectives. The research discussion was organized around four themes.

1. Growth and development through shadow education.
2. Carrier, social growth and stability through Shadow Education
3. Back support of Formal education
4. Challenges in Shadow Education

#### **1. Personal growth and development through Shadow education:**

In this theme it shows the views of the students on shadow education. How shadow education contributes to personal growth and development. It clearly shows how they have developed self – improvement. The three students expressed their experiences and feelings that how the have developed confidence, knowledge, skills and a glimpse of smartness in their formal educational life and thus on their personal growth

Statement by student A “he said that his sir at tuition teaches very nicely with all explanation. He joined tuition because all the concepts are not clear in the school. In shortage of time many topics are taught in a hurry. He has learnt and developed confidence. When questions are asked by the teacher in his school in the classroom he is able to answer fast and correctly. He is confident now in solving mathematical sums. He never ignores the work in tuition classes given by the private tutor.

Statement by Student B, he said his teacher teaches well, clears the concepts using easy examples. He points out the errors done by him and checks the notebooks. Lot of motivation and encouragement is shown by the tuition teacher, he gives extra learning materials. He feels more comfortable to interact with the tuition teacher. A sense of learning satisfaction comes when he explains the mathematical concepts. This has developed his confidence and mental development. He gets focussed help whenever needed. He is now capable of solving much of the mathematics problems from the book.

Statement by Student C, He said that he can ask questions without hesitation. Tutor also explains well, other queries related to the topic cleared by the tutor. He gives different types of sums as homework for practice and thus preparation for the test is done. He said that he is more serious and concentrated in tuition classes. He stated that his tuition teacher is a very easy going person and always motivates him. He says that errors are part of learning. His mathematical concepts has improved; he feels more confident and enjoys learning it.

The student's view reflects how their engagement in shadow education, which involves additional support, personalized attention, and exposure to different teaching materials, has positively influenced their personal growth and development. Before joining they were not that much confident and the

knowledge that they had were not up to the level. They are now getting to learn the tricks and minute important things in solving problems in mathematics. The day they joined the tuition all three were told to learn the tables till 25. Learn the squares and cubes of the numbers till 30. These little things are very much required to learn and understand in learning mathematics. Calculation becomes easy and fast. It develops their mental health which gives him confidence and strength in moving ahead in life.

## **2. Carrier, social growth and stability through Shadow Education:**

This theme explores the strong connection between shadow education and the construction of identity among the students by setting a goal in their lives .It shows how shadow education has supported to grow them in their career and therefore finding a stability in society and their earnings. Students' interactions with peers and teachers, and their parents depicts how serious and involved mathematics learning is and its importance in making stability in livelihood and financially also strong. All three expressed the importance of mathematics and how it differs from other branches without mathematics. Mathematics has its use in all other subjects also.

Student A stated that he is more involved in his studies than before. Solving sums of mathematics book and other extra question given by his private tuition tutor.

Student B said that, now he can speed up with the calculations and it is without mistake.

According to student C, they practice various mathematical problems in tuition only. Sometimes they help their friends in solving sums at school. He said that he has improved a lot in his calculations and understanding. Difficult sums are brought to the private tutor which he could easily understand by the tutor. In view of all this there is a career growth as they will have to face many competitions and if the concepts are clear, with practice they can have great careers which will lead to their social growth and thus stability.

## **3. Back support of Formal education:**

Shadow education is acting as a back support of formal education. Support of shadow education emphasises that it plays a major role in the formal education system. Shadow education supports in the score and achievement of good marks in mathematics subject

Student A said the importance of shadow education. He said that shadow education helped him understand difficult concepts that he couldn't grasp in the regular classroom. He further said, his tutor provides individualized explanations and examples that make the learning process much clearer. This way he is actually supporting the school which we called a formal education place.

Student B said that they usually don't have enough time to cover all the topics thoroughly. Mathematics period seems too short for explanation and solving sums of the chapter. Sometimes the question is so long in Geometry chapters hardly three or four sums could be solved by the teacher. Students and the teacher both feel that they hurried to complete the portion for the half-yearly or final examinations. But, in tuition classes," they get extra time and focus from their tutors. The tutor helps the students understand the subjects more deeply and students gain a better understanding. This statement reflects the idea that shadow education complements school education by allowing students to explore subjects

in more depth and at their own pace. Participant C has a similar idea to Participant B. Shadow education in mathematics supports and enhances the formal system of education

Student C said that there are more students in his class. Sometimes it is difficult to manage the class discipline and teaching mathematics. He said individual attention is given and the tutors make sure that the child is learning or understanding the concepts. This way students will answer the teacher in the school when any question asked in mathematics. They become active and smart in answering mathematical problems. Vygotsky (1978), learning occurs through social interactions and the cultural context, and shadow education serves as a supportive component that complements formal schooling and acts as a back support for individual learning needs, offering personalized attention, and providing additional resources and guidance.

#### **4. Challenges in Shadow Education:**

This theme throws light on the various challenges that students face when they are engaged with shadow education. It may turn into difficulties, barriers, and limitations when they are joining the additional academic support outside the regular classroom setting. This is known as a system different from the school regular system. Students were asked about the challenges they face during private tuitions.

##### **(a) Heavy workload:**

According to the student's statements they have to balance school assignments, exams, and the extra study materials provided by their tutor. It becomes very challenging to manage all the work together. Project work, unit tests, curricular activities of the school and tuition work all they have to do at the same time in the running session. Students have to participate maximum. Along with these loads their tuition work and home work make them restless and overburdened with heavy workload. Effective time management and dedication are required to cope with this workload.

##### **(b) Problem in time management:**

Time plays a very important role in the life of a student. They already spend 7 to 8 hrs of schooling. After coming home spending time in other activities including playing and homework refreshing, they have to go for their tuition classes. It becomes difficult to manage the time of both the school and the Private tuition timing. Students should not be absent in the school as well as they should not miss any tuition classes

##### **(c) Financial Burden:**

Financial burden is the major obstacle in shadow education. This is very true that everyone cannot afford private tuition. Tutoring can be very expensive. Many parents cannot afford tuition for their child. Tuition fee is the extra money parents are paying for the upliftment of the child. Sometimes it is seen that normal working parents are also unable to pay the fee for their tuition. There is no provision also available for those students who cannot afford to pay.

##### **(d) Tuition teacher does not follow the course of study which is followed in school:**

School teachers never follow the time table, course studies for the students who have joined private tuition. Teachers follow another system of school related to teaching and other activities. In mathematics if a teacher is teaching any particular topic then it will not be the same for the tuition teacher to teach



the same topic. The additional material learned from the tutor may not always align with classroom teachings, making it difficult to match the differences and stay on track with both sets of materials. These challenges highlight the need for effective time management, financial accessibility, and alignment between shadow education and the formal curriculum.

### **Conclusion and Implication:**

The researcher conducted this study to understand and know the benefits and challenges of shadow education in mathematics learning from students' perspectives. Through phenomenological approach, the research had lived experiences of students engaged in shadow education for mathematics learning. The findings and the results show the complexities of shadow education and have important implications for mathematics learning and practice. The study came out with four main themes based on the participants' or students' narratives: Growth and development through shadow education, Career, social growth and stability through Shadow Education, Back support of Formal education, Challenges in Shadow Education.

In this study, shadow education in mathematics learning has been found to positively impact student's confidence, knowledge, skills, and behaviour. It allows students to explore their potential in a positive manner. Shadow education also shapes student's futures with some challenges, such as, heavy workload, financial burden, and conflicts with the school curriculum. Although shadow education provides support for formal education by fulfilling individual learning needs and providing personalized attention, some challenges, such as heavy workloads, financial burdens, and conflicts with the school curriculum, can reduce its effectiveness. This study focuses on the significance of integrating shadow education practices into educational policies and informing parents about the potential benefits and challenges of shadow education.

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