# [PEDAGOGY OF TEACHING MATHEMATICS](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)

[**Opinion of Author**](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)

[*In the article, I will share some engaging strategies to boost our students’ learning. We as a*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*teacher know that collaborative learning and engaging activities promote critical-thinking*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*skills for the student. However teaching a subject like maths is a completely different*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*approach unlike other subjects; math cannot build a logical understanding of itself. While*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*rote memorization may help to manage, but cannot superficially grasp requirement skills,*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*and does not build a solid foundation for more complex concepts. We (teachers) can’t*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*successfully even move forward in our teaching without a strong understanding of previous*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*concepts of learners and this is the most challenging that we face in maths teaching.*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)

[*Moreover, the purpose of this article is to discuss these different methods in the lecture,*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*inductive, deductive, discovery, analytic, synthetic, problem-solving, and laboratory methods.*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*We may adopt some method to teach according to the specific beliefs of the syllabus.*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*Although, teaching maths is uncertainty and it has different merits and demerits based on*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*learners' skills. Mathematics is a kind of subject that requires practice and exercise with*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*many theories; therefore drill work teaching-learning is important in teaching mathematics. I*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*use a drill because I expect speed and accuracy in solving mathematical problems; however,*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*this drill work should be based on the learner's psychological principles. These psychological*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*principles are going to discuss in the article, on how it can use teaching strategies. I also will*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)[*be listing down some approaches and strategies of teaching.*](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)

# [Introduction](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)

[Mathematics teachers need to be aware and should have different teaching strategies because](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [there are many learners doesn’t like maths subject. Although the term pedagogy refers to the](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [strategy of how teacher plan to teach in practice and theory, pedagogy also shaped the](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [teaching beliefs of a teacher. It interplays between context and a variety of methods of](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [teaching. Math is a very challenging subject for both to teach and even to learn, but it’s also](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [one of the most rewarding subjects to learn because maths usually has the right answer.](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [Teachers have to adopt proper teaching methods according to the learning environment and](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [educational background of the students. This will keep the motivational level of students](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/) [learning environment otherwise they lose interest in mathematics. Many strategies are used](https://bidyapatibedstudy.wordpress.com/b-ed-study-guide-book/)

but not all the strategies are effective as it plans for teaching mathematics because it depends on the learner's characteristics. Mathematics is taught learners to solve problems with many strategies although in reality these strategies don’t even fit into a certain lesson or a certain student nor do they necessarily have those strategies for solutions. Mathematics is a subject that is quite different from others, this subject requires constant practice and revision, it is not done, then one tends to forget the concepts. Therefore, it has to understand the material rather than memorize the procedures.

# Instructional objectives of teaching Mathematics

Teachers know that teaching maths does not come with anything easy, and one cannot do it without the use of the fundamental process. Teaching with effective strategies will help to understand how to teach in an interesting way to students, but transferring all these with passion is a tricky task. An instructional objective is what mainly considers what the learner will be able to do after completing the teaching. So teachers have to plan how can it make learning math fun, and effective pedagogies encompass a different range of techniques, that include a detailed guide for teachers, structured guides for learning, assessment practice, and individual activity. These objectives are very helpful in the process of assessing student learning, moreover Instructional objectives referred to the best way to learn a subject such as mathematics and make it as tangible as possible. The objectives of teaching mathematics are to help learners:

* + 1. Consolidate the knowledge and skills acquired;
    2. Visualization of basic concepts, and underlying processes and skills;
    3. Develop mastery of skills;
    4. Help to understand the concept in a better way;
    5. Develop drawing skills;
    6. Proving a result or solving a problem;
    7. Developing ability to think, analyze and articulate logically;
    8. Develop necessary skills to work with calculators, computers, etc;
    9. Develop interest problem-solving in various structures and patterns; and
    10. Develop contributions to the field of Mathematics;

To achieve all these objectives from a heterogeneous group of students, an educator must be enthusiastic and encourage behavior toward a student to prevent students from getting these

negative attitudes, because diversified capabilities are a big task on part of teachers. Although, achieving these teaching objectives, required many skills and appropriate practicing strategies with innovative methods of teaching. Moreover, the instructional objective is expected better result in the learning outcome. The teacher expects the result of his/her instruction will continue to occupy a prominent better outcome however they must keep raising the bar for innovative methods of teaching slowly and steadily. This might help to develop mental abilities for students and mathematics cannot be learned without appropriate practicing strategies. In mathematics, there are a number of concepts that have to follow to build a proper growth mindset because some skills are not purely psychomotor for every student. It has to be integrated under the cognitive domain, but this domain includes objectives that deal to recall or recognition of knowledge, therefore, it very important to be patient to teach them sequential manner.

# Inductive - Deductive Approach

As per a survey report, Maths is considered one of the least favorite subjects of various academics that are why it needs to identify issues early on. Although this subject can be taught with different methods and strategies, however, it has to identify how students will learn because this subject is completely different from other academics and it is typically a progression-based subject. To solve these mysteries, one has to understand the inductive and deductive approaches. Sometimes educators try something new, in the hopes that it can make a difference in students learning. The use of the inductive method is to move from specific examples to generalization on the other hand use of the deductive is to move from generalization to specific examples both approach is opposite to one other. To help students for better understanding, an educator shouldn’t stress and try only one method to change because in mathematics all the work cannot be done orally, therefore oral work must be used as supplemented and written work as practice. This will helps the student to know the amount of study done by them. The inductive approach is based on the process of induction therefore; it proceeds from the concrete to the abstract. This approach can construct a learning formula with the help of sufficient number of concrete. Here are

* + 1. Introduction of new topic;
    2. Formulation of rules;
    3. Derivation of formulas; and
    4. Generalization;

Usually, maths instructions start with concepts and are taught in a way that does not bring an understanding majority of the students, even those teachers’ tries to use formulas, theorems, and examples. The best thing about the inductive method uses reasoning patterns and observations to draw conclusions and making guesses, whereas, the deductive use reasoning facts, definitions, and accepted properties in a logical order to draw appropriate conclusions. Students can present some problems related to one particular domain, and then they try to establish a formula, rule, law, or principle by observing. Using the inductive method student “Perceives” what the teacher presents and how the concept is used, and the deductive method of teaching is totally different from the inductive because the deductive method is a teacher- centered approach. The teacher gives a new concept, explains it, and then students practice using the inductive concept, therefore inductive is the reasoning method and this concept helps students able organize what they observe. With help of inductive reasoning, students become math detectives and they look for patterns, try to notice similarities, and then draw a conclusion that is proved later.

# Advantages of preparing a Lesson plan

Teaching is challenging however it is the most rewarding profession and preparation can be an important part of the teaching journey. Therefore lesson plans important aspect of making successful teaching; lesson plans are carefully considered at various stages in a lesson, and plans are required to achieve the learning objectives in the given period. The lesson plan will show a clear road map exactly a complete picture of how a teaching-learning journey will be facilitated. Moreover, teachers approach various ways for different learners for a single objective, but all teachers plan based on their own methods and strategies, and experiences they use before. While during preparation for teaching they include pedagogy aspects of the lesson and create daily activities in education. Which has often focused on knowledge and skills; typically it’s focused on helping to develop new competencies and new skills. Clear planning is a key place in which teachers develop and show the high expectations they surely have of all the pupils they teach. Whenever educator observes effective mathematics teaching, the result is their planning. Nothing could be further from these truths, successful teaching carries out the best planning and it remains for them of critical importance.

* + 1. Enables rehearse various aspects;
    2. Helps to becomes more rigid;
    3. Develop a positive attitude towards learners;
    4. Develop investigative skills;
    5. Makes more receptive ideas of content;
    6. Provides a negotiation, discussion and evaluation;
    7. Creates a confidence student outcome;
    8. Provides deep thinking and development; and
    9. Ensure that lessons begin interestingly, maintain a good pace;

Teaching plans come with many different options and features even different layouts, which are based on content and the learner's environment. It is undoubtedly important to be clear about lesson planning with the objectives that what students to learn. There are numbers of disadvantages of lesson plans to create because they create a clear strategy with curiosity about the subject matter. There are a number of reasons why mathematics teachers always observe and then approach teaching; it also gives chance to think about the lesson objectives, class activities, and the materials to use. A good teaching first step is, to begin with, lesson planning with a reasonably self-contained part of a lesson to manage day-to-day teaching activities. These guide them and support them in maintaining a teaching pattern and undoubtedly it does not let the class deviate from the main topic. Moreover, it also provides with best learning objectives to enhance the effectiveness of the learning process, and another view that helps to organize detailed teaching plans. This is one of the best strategies to buy as a teacher because with any planning nothing can achieve.

# Analytic and Synthetic methods

There is no fixed axiom set in maths teaching, but instruction is an important skill in order to meet the different learners in a classroom. The analytic method is the logical thinking and reasoning abilities of students and the synthetic method is an elegant presentation. However, remediation and intervention strategies can make effective teaching because remediation involves re-teaching and intervention is an appropriate strategy to check learning difficulties for students. With the help of analytic strategies breaks down the learner’s skills levels and moves from unknown to known, and from the process of synthesis put together known information and moves from known to unknown. Analytic and synthetic strategies are to oppose each other process, but they complement and support each other. Basically, these are used in proving the results and solving sums, while effective teaching-learning transactions and achievement of teaching use appropriate methods and pedagogic for providing the best learning experiences to the students. Teachers use the analysis method in the process of

deduction wherein they cut down a concept into smaller then synthesis method makes a new learning proposal. Here is comparison of analytic and synthetic methods

|  |  |
| --- | --- |
| **Analytic methods** | **Synthetic methods** |
| Analysis means breaking up | Synthesis means combining |
| Unknown to known | Known to unknown |
| Complex to simple | Simple to complex |
| Psychological method | Logical method |
| Valid reasons to justify | No justification |
| meaningful learning | Rote learning |
| Can easyly to re-discover | not easy to recall |
| Process of thinking | Product of thinking |

Both are interdependent in all teaching-learning processes because analysis forms at the beginning and synthesis are for the follow-up process; although, in teaching maths, both methods go together. To make a better understanding of mathematics one has to use an analytical approach but to retain the knowledge of what one has learned and to recall what was tough, one has to use a synthetic approach. In this method, we can analyze the problem and then move toward a solution; this is also called the descriptive method. It leads the teacher to apply different kinds of teaching operations. They also try to use all these methods quite simply and led their teaching-learning method. The process of analysis makes a clear concept but children learn problem-solving skills at different rates, they don’t have the same skills. Moreover, in the maths classroom problem solving is one of the most important skills children have to develop and the synthetic method is based on already learned concepts. Therefore it is quite necessary to go with the analytic method to master concepts then the synthetic method has to be used to solve the problems. Students who learn how to solve problems have a deeper understanding of the analytical approach and synthetic method. Good teachers know that intellectual to become actively engaged and develop flexibility.

# Principles of Curriculum development in Mathematics

The curriculum is one of the most important approaches to course design focusing on the understanding that each learner. This curriculum preparation may be the formal and informal content, whatever learning environment is operating in, and its good practice to utilize all components with the strategy to be able to generalize the best content. There are four major components in the educational process practice Curriculum; Teachers; Students; and Contexts. Although the instructional strategy is the best for imparting knowledge to students,

therefore responsive curriculum is the uttermost goal of teaching-learning. Curriculum planners have to consider base on these components and characteristics before deciding on the implementation. Implementation of the curriculum is equally important as construction, and during developing curriculum it should keep in mind which approaches to development will give the best for learners. There are various approach have developed base on the theoretical perception of the learners and the curriculum development process consists of the following

* + 1. Assessing the educational needs;
    2. Formulating objectives and learning goals;
    3. Selection of best learning experiences to accomplish objectives;
    4. Selecting the most rich and valuable content;
    5. Organizing and integrating relevant content; and
    6. Timely and accurate evaluation of all development process;

The educator should be aware of these conditions as possible availability then instructional methodologies can improve in teaching. In this way, teachers become capable to find out the solutions to different kinds of teaching not only during the preparation but in their routine development process as well. Every teacher has the curiosity to explore their teaching things and this psychology of teaching can be utilized in a better way through the educational method. It is important for the teacher to gain experience and build up a solid foundation of skills and knowledge in mathematics teaching otherwise they wouldn’t be able facilitates their teaching development in various aspects of children in the classroom learning. On the other hand, students are expected best learning, therefore, the teacher should develop the best strategies to construct their teaching mathematics knowledge. A variety of teaching activities can be geared towards learning development, mathematics learning objectives are completely different processes compared to other learning materials. This can be differentiated based on the process child's learning environment, content, or product. Here teachers should understand that PROCESS is how the students learn information, CONTENT is what they learn and PRODUCT is how it demonstrates.

# Characteristics of a Good test in Mathematics

One of the most effective ways to prepare for or conduct a test is to make sure that will helps the child's learning environment, and this is the primary stage. Other side children must be

given the opportunity to deal with concepts which have tough without fear and boredom. The test must be taken to provide various mathematical brainstorming strategies for releasing ingenuity and for enhancing critical thinking. Especially in mathematics tests required higher thinking skills for students and that should be more developed. However, Teachers should balance strategies because every student has their own thinking and learning characteristics that make them different from others. Therefore educators should understand the characteristics of concrete and abstract things which make them different from other concrete or abstract things. Moreover, mathematical learning testing is a procedure to measure the performance or achievements of students learning concrete or abstract things. This construct for the test means to make sure that they get results of the actual results for their learning characteristics. Teachers have to plan effectively on the basis of these results thus improving teaching and effectiveness. These are an important characteristic of

* + 1. Test needs validity;
    2. Should be highly reliable;
    3. Diagnose the weaknesses and strengths;
    4. Within the norms;
    5. Able to demonstrate the complexity;
    6. To measure the knowledge, skills, and aptitude;
    7. Methods for conducting validation studies; and
    8. Should be recognition the quality objectivity;

These strategies and methods can help effective maintainable tests and also easy to manipulate children learning. Preparation for the test should be able to add, change, or remove with ease because if don’t know how to add test strategies to run against new features, this evaluation may become incomplete and ineffective. Therefore educator should brainstorming method because it is a key tool that applies to most solving and complicated mathematical concepts. Moreover, during the teaching of mathematics in class, there is not only concern with the computational knowledge but also concerned with the other selection of the mathematical content because mathematics is a subject that uses many interlinks. Therefore test should be reliable and valid, because a highly consistent evaluation may measure something other than what it intends to measure. The characteristic of a test should be consistency and result in measuring it does measure reliability and bale to build stronger independent understanding skills also develop illustrated cognitive of thinking.

# Use of material in teaching mathematics

Making effective learning shouldn’t shy away from practice during study time because mathematics is a subject that uses a variety of methods and techniques. In the same way, mathematics teaching should make more interactive and operative materials and pedagogic resources to integrate and best transaction content for advanced learning. Instruction should also slow down to move fast to keep up with the expected standards because students understand the concept behind the lesson is crucial, and this subject is not always easy. Even the highest performing learners should follow this learning pattern to solve problems, without grasping the WHY. Selecting materials and patterns is also very crucial for making effective teaching and even enhancing learning. Although, math teachers should understand that good teaching practice with strong content can provide opportunities for learners to construct rich understandings of mathematical concepts. These teaching-learning materials can be anything ready-made or made by the teacher or students but should be used for clear about the following goals of teaching mathematics

* + 1. Able to develop reasoning ability in thinking process;
    2. Ability to different kinds of calculations related problems;
    3. Make creative by developing analytical and discovering skills;
    4. Enable to learn appropriate size and attractive;
    5. Improvise the teaching various concepts;
    6. To prepare for higher improve methodology; and
    7. Develop scientific approach to understand assist learning;

Teaching materials are generic and use to deliver instruction to make increase learning success. Teaching materials may come in many shapes and sizes, but all have one common goal which is to increase achievement and add structure to lesson planning to delivery of instruction. Mathematics teachers need to organize at different material levels compare to other teachers because this sharing of ideas and experiences in collaborative mechanisms also enables them to carry out innovations. Moreover, their materials should be positive approaches to teaching mathematics with a pedagogical approach. Usually teaching Maths subject does from available textbooks logically but it should not only use this methodology because materials should help learners to feel at ease and supportive learning environment. This material should aim at the development of knowledge and help reinforce new information or skills. It consists of continuous meaningful well-integrated activities and it

should suitable for the teaching objectives because the effectiveness of these teaching aids depends on certain qualities.

# Assignment in mathematics

Mathematics is one the most versatile subject and logically practical or evaluation, even assignment is essential to educational success. These mathematical assignments contain various concepts based on the philosophy of learning by doing. It cannot avoid math assignments because math is more approachable in individual studies moreover these learners need to attempt to solve every problem without the help of any other person. For this approach, assignment refers to tasks assigned to learners by the educator. The purpose of the assignment is to encourage the student to review and practice where they are lacking and able to integrate what he/she has learned in the classroom. These fundamental purposes of assignment for the learner’s teacher want to conduct. These methodologies can guide to check and evaluate the understanding of their knowledge however assignment is not fully supplementing classroom teaching. The assignment is just work assigned for learners who may check their understanding levels as desired by the teacher. Assignment in mathematics has two different kinds of methodologies:

* + 1. Repetitive methodologies - Based on new work; and
    2. Review methodologies - Based on previous topics

Successfully completing mathematics assignments should practice more and more because without practice mathematics cannot be understood perfectly. To grip or fully command the learning content, it’s necessary for a student to use various relevant methods in the mathematics assignment. An assignment is a work allotment for learners to prove their responsibility for his/her own learning. These assignments take a very important role in students' performance to decide the final grade, and the teacher also can act and guide them in case of any difficulty encountered. The procedure to be followed helps to strengthen knowledge in skills and according to the abilities and interests of the students. Practically all functions of assignment to be detailed directions to enable the pupils to meet unsound educational practice. When it comes to assignments, it has to think outside of textbooks and worksheets, thus giving full recognition to the assignment function. Quality mathematics assessment always focuses on the understanding and misunderstanding of learning principles to serve accountability regard for their impact on student learning.

# Innovative practices in teaching Mathematics

The role of education nowadays is undeniable and it also imparted moreover teachers should pay more careful attention to teaching strategies. Innovative methods encourage student learning, as well as collaboration for various learning, and today, where we live in a globalized, is essential to require collaboration with certain ends and goals. Moreover, mathematics education is evolving constantly for effective teaching for enhancing the learning of students. Mathematics is not only concerned with the computational of the subject it’s also concerned with the content understanding and application. Therefore, to emphasize this understanding it’s should be on both rote learning as memorizing the formula, and theorem and applying cognition as the ability to apply a formula in the specific problem area. All this without having innovative methods or strategies can be anything achieved by the teacher. Different teaching aids should be able to be manipulative, and these innovations in the teaching of mathematics can be diversified methods with the pedagogic strategy used in the teaching-learning process. The aims of teaching mathematics that focuses to the higher level of objectives underlying the mathematics subject, like

* + 1. Critical thinking;
    2. Analytical thinking;
    3. Logical reasoning;
    4. Decision-making; and
    5. Problem-solving;

Different strategies and innovations are very important for teaching mathematics, and even both practical and theoretical because teaching strategy can generalize the best plan for a lesson with a specific structure. These innovations can be diversified in arouse interest and enthusiasm in the class. Since fascinating to a different mind that undergoes a change, the learning environment surrounding also continuously goes on modifying new ways which prove better teaching-learning. This strategy is simply able to bring out new ideas and offers learners a valuable opportunity to learn in an immersive manner and more interesting, and even appealing to the learners in enhancing. However, in making for the innovative strategies to be effective, the relationship between the teacher and student, and should be fascinating to each other enthusiasm because teaching and learning mathematics is complex. These efforts should ensure quality in teaching-learning of mathematics and develop a heuristic learning attitude.

# Productive struggle in learning mathematics.

Productive struggle is an effortful learning process that develops grit with creativity for solving problems. One of the best things about these strategies is that never stop learning and effort which is used about getting the right process very well. Productive struggle is developing habits of mind for thinking flexibly, instead of the simply correct solution. It also immerses learners in authentic engagement and consistently provides opportunities and support to grapple. According to education expert teaching alone cannot solve every problem in the maths classroom, it has to allow students to choice of multiple options to solve the same problem because learning mathematic never follow a single method. These strategies have encouraging to math education by providing opportunities for students to share their reasoning and different ways of thinking. Students engaged in this process build the creativity and confidence that helps them solve the problem, but they must have a conceptual understanding to attempt new challenges and problems they have never seen before. Here’s some common teaching for developing productive struggle in math

* + 1. Cultivate independent problem-solving;
    2. Support strong critical reasoning;
    3. Teach students that encountering confusion;
    4. Ensure learning progress doesn’t stall;
    5. Provide multiple approaches to math problems;
    6. Integration for rote memorization;
    7. Conservation and Creativity of similar teaching strategies; and
    8. Develop crucial aspect of cultivating a growth mindset;

It’s important for students to demystify these processes so they understand that their initial uncertainty is a natural part of their learning cycle. This is effortful learning that empowers students and the ultimate goal in a math student is to become mathematical thinkers, not replicators of their teacher. All teachers work together, it’s become more aligned and engaging also they also learn more about what when wrong and what is right to teach. Productive struggle is a state of all engagements that enables them to do their work through increasingly challenging that have never experienced before. With the help of these strategies, they are able to make easier to understand things not harder on students so they are able to stretch student learning methodology for a good result. Productive struggle encourages the learner to try to solve the problem and also promotes comprehension and

mastery. This gives them a variety of options to solve a problem and taught that there are certain ways to solve problems in mathematics that they have never experienced before. Productive struggle is able to break stereotypes and emphasis student ideas; it also allows students to collaborate for productive math. Research shows that everyone is capable of mathematical thinking but good mindset attitudes about math and self-perceptions affect student learning.

# Approaches and strategies in teaching mathematics

Every student has an innate curiosity about how they are able to accelerate their learning skills and problem-solving strategy for maths. There are other strategies that could use to solve math problems apart from the traditional method, however, keep in mind that there are endless ways and strategic approaches individually use to solve math problems. A classroom that gives greater autonomy and effective instructional design develops an understanding of the math problem and is able to plan to achieve results. If teachers are able to visualize which strategies students can achieve and create effectiveness of their learning outcomes, then their teaching approach will make successful. However, it’s not always possible to prepare cutting- edge resources for student to focus their practice and persistence to make good at math. Teachers should understand that most children take time to understand mathematics concepts. Therefore providing effective teaching should be the first priority then followed by feedback, doubt-clearing sessions, and revision. These teaching and learning of mathematics always have major concerns because every child is not able to grasp and understand effective solutions in the first place. Therefore, it must be guided with proper material and strategy to understand the most relevant approach toward a solution. These three types of teaching- learning development models teachers have to follow:

* + 1. Learner-Centred Design;
    2. Subject-Centred Design; and
    3. Problem-Centred Design;

When using or understanding this practice, the child can learn best but it is better if he/she is guided by a self-selected goal because their learning purpose determines what has to learn and the degree to which will learns. According to Piaget, developing new experiences are either assimilation or accommodation, therefore based on this philosophy if the student has available a scheme with which the new experience ties, they can assimilate it. On the other

hand, for the element of assimilation to take place, they will have to accommodate the new situation by modifying the existing one. Effective teaching of mathematics is to help students to understand the material, and these teaching strategies are a long-term plan and design because it has a particular goal. Once the teacher develops all the steps to master, then the student will have a good foundation to tackle their learning. When students are given opportunity to demonstrate their understanding after these foundation for learning concept, their motivation is also increases. Effective teaching of mathematics consistently provides the chance to learn best, over their own learning and able to grapple, these allow them the space to practice different approaches to solving math problems.

# 2.0 Conclusion

The article fully focuses on cooperative learning, classroom management, and learning motivation. Teaching-learning system has a tremendous responsibility to transform a child because the world is changing and education will continue to face challenges due to their evolving natures. Moreover teaching mathematics is unavoidable and if teaching is structured in the right manner, it can contribute to the progress of solving math problems. Mathematics teaches every possible mankind how to analyze a situation, how to come to cross to a decision with the best possible, to be accurate, and to be systematic in daily work habits. It laid a strong foundation by providing the best systematic and open platform for students to learn in a more practical way. Maths teachers should be familiar with all of these teaching methods because there is no single method or appropriate strategy that will work for all learners in solving the problem. Mathematics teachers should be well equipped with their teaching content knowledge too because there is variation in the learning for different students. This indicates that the best methods used in content explanation and effective pedagogical planning always have a change for improvement.