

## Intelligent Quotient based Diagnostic Approach (IQDA): a paradigm shift in science learning

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### **Abstract**

*The paper established a theoretical foundation of IQDA model, and put in front of the world of educationists, researchers, policy makers and the teachers to explore the relationships between IQ, and students' performance of learning. In this model, teacher first assesses the students' IQ levels, and uses the new model of "Intelligent Quotient based Diagnostic Approach (IQDA)". The poor performed students of the class will not be isolated in the general classroom situation; they will listen, and enjoy the class. That is why, the author developed the special guidelines to treat the children for effective science learning. The good, average and poor performed students select in the IQ test, and accordingly the each group treated with IQDA model of learning. Intelligent Quotient based Diagnostic Approach (IQDA) is a paradigm shift in science learning.*

**Keywords:** diagnostic approach; intelligent quotient; paradigm shift; science learning

### **Introduction**

Learning is an active process requires intelligence and

thinking. Learners learn listening, speaking, reading, and writing with own pace. Every time they learn and gain new ideas, and actively constructed own propositional network to represent idea. The new idea organizes with the old ideas, as they try to combine the new and old into a coherent system of ideas. More effective teaching methods are designed to stimulate thinking, to replace boring with exciting activity, but the question is does it possible to utilize in the classroom well. Many authors emphasized that the teaching methods are trustful of reason, stress on open-mind, flexible, and fair-minded. Teaching methods are honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstance which permit inquiry. If we will think critically about our own study we can always read, write with an active mind, where our reading, writing will not be followed by an external teaching method. Teaching model of discovery learning (Bruner, 1961), problem-based learning (Boud & Feletti, 1997; Dewey, 1997; Duch et al 2001), inquiry learning (David, 1996), experiential learning (Itin, 1999), and

constructivist learning (Bruner,1973),concept map learning of Novak (1997) differently named, but essentially these are pedagogy equivalent approaches, includes in science instruction. Here, students are placed in inquiry learning contexts, and asked to discover the fundamental and well-known principles of science through activities. Researchers like: Anderson et al 1978;Chang, Sung, Lee,2003; Chi, Feltovitovich & Glaser, 1981; Coffy,Canas & Reichherzer, 2003; Coleman,1998; Cooney,1994; DeVeries,2002; Fraser,1993; Genter & Steven, 1983; Glasser, 1991; Jedge, Alaiyemol, Okebukola, 1990; Jena,2011; Joycee, and Weil, 1980; Kaure,1991 worked elementary school students, secondary school students, and medical students to know the effectiveness of the models found that models are useful and enhanced performance, recall, motivated to learn, created interest, clarified doubts , assisted in organizing thoughts, promoted understanding in learning.

### **Need for a new model in science learning**

Six years the researcher has applied different teaching strategies in primary and secondary classes, and faced so many difficulties of making the desired changes among students. A teacher may faces difficulties during the application of new models because of time constraints, tensions with the situation of classroom realities, preparing students for the next level, and issues related to higher education. Now the questions rose: (a) *are the students' clarifying their doubt and misunderstanding through the recent approaches? If so, why students' critical*

*thinking, investigating ideas are poor?,(b) all constructivist approaches are student centred, but the question is in front of the world of educationists whether students work and engage themselves within the classroom context. Does student centred approaches motivate learners, and affect directly the critical thinking in science?, (c) The previous knowledge helps in further reading, writing, and the reasoning skills of the students. If the students are unable to retain the previous experiences then how they could link, interlink new knowledge with the previous knowledge, and (d) most noble laureates and scientists have completed their studies by traditional approaches, starting from primary education level to post graduation levels then, why and how we could neglect these teaching models.*

### **Significance of IQDA model**

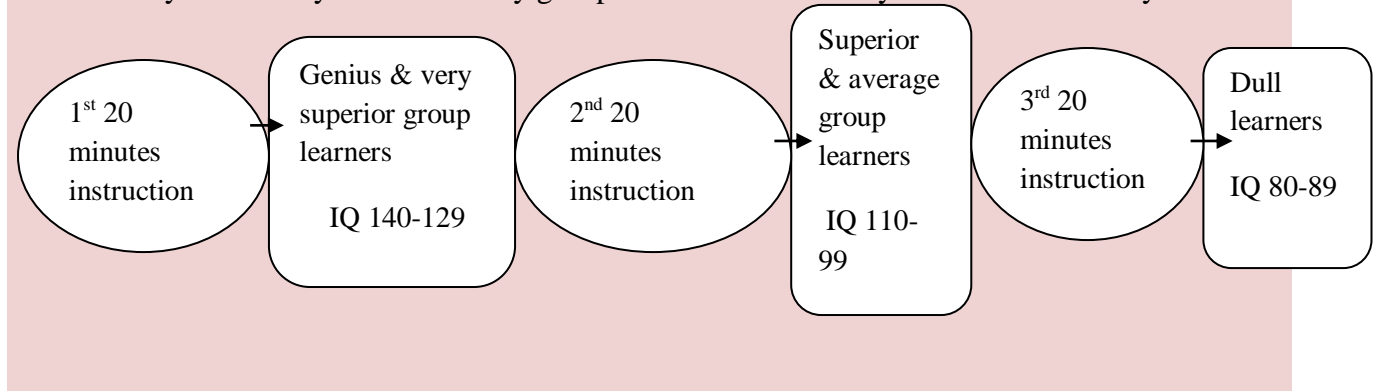
The researcher emphasized the recent idea, placed in front of the world of educationists to get suggestions for the development of this holistic and systemic approach. Here, "holistic" is in the sense of giving treatment to all categories of IQ students in a common classroom, and "Systemic" is in the procedure of selecting and treating students for interactions. The model prescribed following steps for the paradigm shift in science learning.

### **Prescription of instruction**

An IQ test can classify the students into different categories. That is why, teacher should administer any standardized intelligent test in the class to assess the IQ of all students, and accordingly he/she can divide the whole class into 3-4 groups.

Fig-1 prescription of instruction

Same concept, three groups would be learnt, but hierarchically downwards and each group will learn twenty minutes by means of every group will be learnt directly as well as indirectly an hour.



The high IQ students, average IQ students, and low IQ students should be classified without their concerned. Poor students of the class will not be isolated in the general classroom situation, they will listen and enjoy the class, but the teacher should not behave or show the cynical attitude to the students. The average IQ group of student will be selected from the IQ test, and accordingly the groups will be fixed for their treatment. High average, superior and genius students will be selected through intelligence test.

#### **Assigning students to choose their modes and methods of learning**

The different cognitive and learning styles of students assigned to choose their opinion towards models and methods of learning, including traditional methods, activity based methods, concept map methods, creativity methods, inquiry method, discussion methods, laboratory methods, experimental method, or direct observation methods those they can choose freely. However, students may select individual learning, or they may select collaborative learning. Freedom should be

given to the students to choose the methods and contents.

#### **Level based instruction**

The poor and average group of students should be instructed first, followed by the average performer students. However, the high, superior, genius and gifted students group need higher order of learning instead of normal basic learning. That is why it is necessary to take their views regarding methods and modes of learning. Accordingly, the teacher prepare for the instruction, demonstration, and experiment.

#### **Interacting, discussing, illustrating, and practicing the concepts**

The interaction, discussion, and illustration with examples are the traditional approaches, and now teacher assigns the methods to poor, slow and below average students. In the very preliminary stage, they should learn through discussion and illustration methods, then they want to compare and contrast through practical works.

#### **Freedom for asking questions**

During and at the end of the instruction, teacher should frequently ask questions to

the students to know their status of learning. Here, formative and diagnostic evaluation is important than summative learning. Grading instead of marking is a suitable technique to interpret the summative test. Feedback should be given to the students.

### **Paradigm of IQDA model of teaching**

#### **Syntax**

IQDA is a new model for teaching learning process. Teacher should administer any standardized intelligent test in the class to assess the IQ of all students and followed by that grouping of students and stating of IQDA teaching. This article offers a model for analysing the changes in students' listening, speaking, reading and writing style of individualized instruction. This multilayered approach is useful to textual analysis, thinking and writing to master during the instruction. For self-regulated learning, students should choose their modes and methods of learning then students will be able to assess their own performance on a learning task. In an hour single classroom, same concept, three groups would be learned, but hierarchically, and each group will learn twenty minutes by means of every group will learn directly as well as indirectly an hour. The poor and average group of students may participate or not, it means the procedure is optional.

#### **Social system**

Teacher begins the task and then students take over. The social climate is vigorous and abrasive but in a non-threatening manner.

#### **Principles of reaction**

- (1) Maintain an intellectual climate
- (2) Respect all learners' knowledge and intelligence by avoiding direct evaluation of student opinions
- (3) See that issues are thoroughly explored
- (4) Probe of relevance, consistency, specificity, generality, definitional clarity and continuity.

- (5) Maintain dialectical style

#### **Support system**

To support the syntax of the learners, the previous knowledge, social system and attitude of the learners are most important to visualize the effectiveness of IQDA model among students.

#### **Educational implications**

##### **(a) Curriculum design**

IQDA is an effective tool for making the structure of knowledge explicit, and the researcher hopes it should be accessible and more easily integrated by students. According to IQDA the curriculum should be described based on levels of the learners and constructivist principles and will support problem-centred and student-centred, and a holistic style of learning approaches. The policy makers and educationist should take incentive to design IQDA curriculum for all subjects in education. Student will discover the themes that they want to emphasize and they organize knowledge differently to challenge their ways of thinking but in traditional course plan students have no freedom to think or organise knowledge. From the IQDA curriculum student can identify concepts that are key to more than one discipline, which helps to move beyond traditional disciplinary boundaries. IQDA curriculum help students and teachers to select appropriate instructional materials and accordingly the teacher can provide individual learning that incorporates teaching strategies as well as time and task allocations for various parts of the course and visually explain the conceptual relationships used for the objectives in any course. The curriculum framer may facilitate efforts to reconceptualise the course of content to provide a basis for discussion among

students and to summarize general course concepts, which helps to increase the ability to provide meaningfulness to students by integrating concepts. Such curriculum can help to develop courses that are well integrated, logically sequenced, and have continuity with previous and new knowledge. So teachers can design units of study that are meaningful, relevant, pedagogically sound, and interesting to students. IQDA helps the teacher to explain why a particular concept is worth knowing and how it relates to theoretical and practical issues both within the discipline and without the discipline.

#### **(b) IQDA in teacher education programme**

The greatest challenge is to introduce IQDA in formal schooling. Teachers need to become familiar with the use of IQDA first than it will be easiest to use in general classroom situations. So, it needs to engage teachers and administrators in training programs to understand new educational approach, as New Model for Education. Teacher educator should need to learn about the theory underlying IQDA. Teacher education programs should adopted such model for the learning. Teachers should work collaboratively to identifying the IQ and difficulties among students.

#### **(c) Open, correspondence or distance education**

IQDA is an emerging technology is becoming widely used in universities and institutions around the globe. The researcher realised that Open, Correspondence and Distance education and their pedagogy, technology, and instructional system should be designed that aim to deliver education to students who are not physically "on site" in a traditional classroom or campus. Open, Correspondence and Distance education courses that require a physical online-site presence for any reason (including taking examinations) is considered a hybrid or blended course of study. By using student's IQ based, distance learning will be more recognized for its potential in providing individualized attention and communication with students internationally.

#### **(d) IQDA lesson plan**

The researcher in this paper emphasizes separate course plans for every student. The researcher felt easier in IQDA instruction by using such lesson plan as given below and faced more comprehensive understanding and skills of what he has prepared to teach, eliminating sequencing errors.



**Table-1 IQDA INDIVIDUAL Activity Plan PROFORMA**

<p><b>IQDA INDIVIDUAL Activity Plan No.....</b></p> <p>Name of the student-----</p> <p>Subject –</p> <p>Class –</p> <p>Topic –</p> <p>Concept –</p> <p><b>Goals and objectives</b> - During and after IQDA, students will....</p> <p>Understand science concept.....</p> <p>Find out the cause of a reason</p> <p>Identify misconceptions.....</p> <p><b>Pre requisites:</b> - Before beginning IQDA, the student should have some knowledge that can fit to the new concepts.</p> <p><b>Materials and Resources</b></p> <p>General and low cost teaching aids</p> <p><b>Guiding question:</b> -</p> <p>How does .....What happen.....and.....?</p> <p>Why it happens.....?</p> <p><b>Lesson out lines and procedure:</b> -</p> <p>Read page..... On ..... in your text book. Choose the important key difficulties from them. Arrange and think and ask the teacher for understanding</p>
<p><b>Space for writing difficulties</b></p>

**Conclusion**

In this paper, I have tried to present the theoretical foundations of IQDA Model. While at first glance, IQDA may appear to understand the foundations for this tool and its proper use will lead the user to see that this is truly a profound and powerful tool. It may at first look like a simple IQ test, but when care is used in diagnosis, it

will give good result with meanings. IQDA has been shown to help learners to learn, researchers to search intelligence followed by diagnosis create organizations of knowledge. I also wish to use this document as a foundation for further experiment, critique, and dialogue regarding the use of this tool. This document itself should be an original document, with revisions occurring

periodically as I gain new knowledge and experiences with the use of this tool. We invite all to use this model of IQDA as a teaching tool.

#### Acknowledgement

The researcher has not taken any financial help from any source. This is personal research and this piece of research work had not needed much money.

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