

## Error analysis and related aspects of learning and teaching

Error analysis is the study of errors in learners' work with a view to looking for possible explanations for these errors. It is a multifaceted activity involving analysis of correct, partially correct and incorrect processes and thinking about possible remediating strategies.

**Quantitative error analysis** was carried out using a coding sheet for each grade. A reliability coefficient was found for each test, as were item means and discrimination indexes for each item. The analysis provided some insight into the more common procedural and conceptual errors evidenced in the learners' scripts. Findings showed similar difficulties across intervention and control schools and highlighted particular areas of difficulty.

### The purpose of error analysis:

- 1) identify the patterns of errors or mistakes that students make in their work
- 2) understand why students make the errors, and
- 3) provide targeted instruction to correct the errors.

When conducting an error analysis, the teacher checks the student's mathematics problems and categories the errors. Errors in mathematics can be factual, procedural, or conceptual, and may occur for a number of reasons.

### According to the present state of error research, students' error

- are casually determined and very often systematic
- are persistent and will last for several school years, unless the teacher intervenes pedagogically
- can be analyzed and described as error techniques

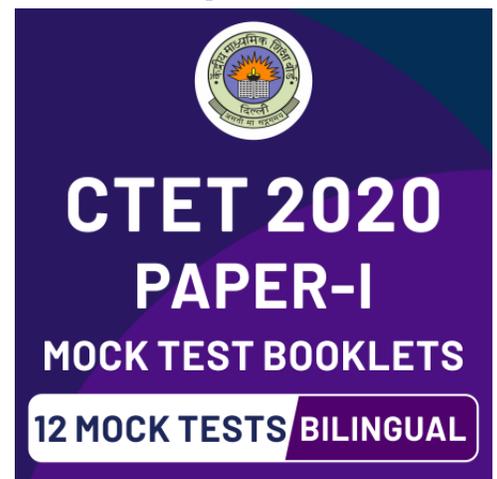
### Common Student Challenges

The first step of error analysis is to correctly identify the specific errors displayed in students work. First, let's look at a few reasons why students may make errors.

**Lack of knowledge:** Students' lack of knowledge could be a major reason why they cannot solve certain problems consistently.

**Poor attention and carelessness:** Other possible causes of student error are poor attention and carelessness. To address this issue, teachers should first consider the alignment between the instruction, student ability, and the task.

Identification of students' specific errors is especially important for students with learning disabilities and low performing students. By pinpointing student errors, the teacher can provide instruction targeted to the student's area of need. In general, students who have difficulty learning math typically lack important conceptual knowledge for several reasons, including an inability to process information at the rate of the instructional pace, a lack of adequate opportunities to respond (i.e., practice), a lack of specific feedback from teachers regarding misunderstanding or nonunderstanding, anxiety about mathematics, and difficulties in visual and auditory processing.

The advertisement is a vertical rectangular box with a dark purple background. At the top center is the circular logo of the Central Board of Secondary Education (CBSE), India. Below the logo, the text 'CTET 2020' is written in large, bold, white capital letters. Underneath that, 'PAPER-I' is written in slightly smaller, bold, white capital letters. Below 'PAPER-I', the text 'MOCK TEST BOOKLETS' is written in bold, white capital letters. At the bottom, there is a white rounded rectangular box containing the text '12 MOCK TESTS BILINGUAL' in bold, dark purple capital letters.

**Newman (1977, 1983)** defined five specific literacy and numeracy skills as crucial to performance on mathematical word problems: reading, comprehension, transformation, process skills, and encoding. Newman's Error Analysis (NEA) provided a framework for considering the reasons that underlay the difficulties students experienced with mathematical word problems and a process that assisted teachers to determine where misunderstandings occurred.

While most mathematical questions involve the use of words, not all are classed as word problems. A primary condition of word problems is the inclusion of a word description of a context within which the problem resides.

Example: Rahul went on a bike hike. He rode 402 km on his bicycle over 6 days. He rode the same distance each day. How far did Rahul ride each day?

while the language demands of the mathematics curriculum are important and need to be developed, they also contribute to the difficulties experienced by students struggling with mathematics. Thus, mathematics teachers must be aware of the literacy and numeracy issues involving word problems.

An analysis of learner errors does require mathematical content and pedagogical content knowledge on the part of teachers, but it would also serve to broaden teachers' knowledge of mathematical cognition and concept development.

### **TEACHERS AS A RESEARCHER**

Research is a voyage of discovery. It is a systematic quest for answers to unsolved problems. Teachers are always on an unending quest for many things- new knowledge, ways to improve learners' achievement, techniques to enhance their content delivery etc. As long as they are involved in the teaching-learning process, all teachers act as researchers in some capacity or the other.

Every day teachers actively involve themselves in research in their classrooms. Constantly striving to attain balance between learners' potentials and parental expectations, optimizing the available resources for high learners' achievement, planning lesson delivery content and modes, evaluating learners' performance, and working cohesively with administrators are all part of teachers' role as researchers.

Teachers research aims to enable teachers, administrators and policy makers to make sound decisions and effective policies regarding educational aspects which will best serve the learners with teachers acting as researchers, these decisions and policies become more feasible.

### **Action research helps the teachers in:**

- improving their teaching performance
- enhancement of learners' achievement and improvement of the situation in which the practice takes place
- better understanding of classroom problems and deriving solutions
- developing new and improved classroom practices beneficial to the learners as well as the teachers.



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