IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

LEARNING MATHEMATICS IN ENGLISH PRESENTS SEVERAL DIFFICULTIES

Ms. J. Archana,
II-B.Sc. (Maths)
Muthayammal College Arts and Science,
Rasipuram, Tamil Nadu.
Ms. A. Mesharath Banu,
II-B.Sc. (Maths)
Muthayammal College Arts and Science,
Rasipuram, Tamil Nadu.
Ms. A. Manjula,
Assistant Professor/English,
Muthayammal College Arts and Science,
Rasipuram, Tamil Nadu.

ABSTRACT

The Student in Mathematics is decreased year by year because of learning difficulties in English. Having studies in Tamil medium, we have not mastered English yet. It is now blocked. Vocabulary, word problem, written expression, use of resources, self-reflection awareness these are the detecting barriers. How hard we struggle to understand the content. So, let's say it simply. Some students fail the exam because they don't know English at all and it is very difficult for us to read a book in the field of mathematics because we have never studied English well, we don't know anything about its vocabulary, grammar, verb we don't know how to use longer in a sentence, let's take about its short comings.

BACKGROUND

The number of students commencing Muthayammal College of Arts and Science has fallen dramatically in the last few years. In a longer point of view one who says that undergraduate Mathematics is a superior education but today it is a basic education. In these past years the students changed their desires of studying mathematics because of difficulties that they faced in Math. At the same time, there is large and increasing demand for society from individuals with different kinds of mathematically intensive academic education. Only a few students should pass the examination because of not understanding English well. Others fail due to the issue of not knowing English well. Due to corona some of the students failed to learn English. These are the major problems faced by math students to learn mathematics in the English language.

The Idea of learning languages

- Learning mathematics in English poses challenges for non-native speakers. The major difficulty is the language barrier as mathematical concepts often involve specific terminology and expression that may not directly translate.
- Students might struggle with word problems due to unfamiliarity with English wording or phrasing.

- It is crucial to build a strong foundation in both English and Mathematical skills to overcome these challenges.
- Tamil medium students find it difficult to grasp the precise meanings of terms and symbols.
- English may introduce diffidence in mathematical phrasing leading to misunderstanding especially in complex problem-solving situations.
- English words have similar meaning and this creates confusion when interpreting mathematical instructions or problems.
- Word problem is a common part of mathematical education that requires not only mathematical skill but also a strong command of English to decipher and comprehend the problem correctly.
- Proper pronunciation in mathematical terms is essential for clear communication and mispronunciation leads to misunderstanding.
- Expressing mathematical proof in English demands precision, clarity and non-native speakers may struggle to articulate their reason effectively.
- Teaching methods may differ from one place to another leading to an additional layer of adaptation.
- Limited exposure to English outside the classroom might hinder the ability to engage with mathematical content effectively.

DETECTING LEARNING DIFFICULTIES

Identifying difficulties in learning math in English involves observing various aspects of a student's performance and engagement. Here is specific way to identify challenges:

Vocabulary Proficiency

Assess the students' understanding of mathematical vocabulary in English. If there is a struggle with terms it may indicate language related difficulties.

Word Problem Solving

Observe how the student approaches and solve word Problem Difficulty in understanding and translating English text to mathematical operations might highlight challenges.

Written Expression

Evaluate the clarity and precision of students' written explanations for mathematics concepts. Language-related difficulties may manifest in written assignments.

Use of Resources

Observe if the student effectively utilizes English language resources such as textbooks, online materials or reference guides.

Communication During Problem Solving

During problem solving activities pay attention to how the student communicates their thought process. Difficult expressing ideas may point the language challenges

Self-Reflection Awareness

Encourage students to reflect on their own learning experiences. This self-awareness can provide insights into areas of difficulty**.**

CAUSES AND TRAITS OF LEARNING CHALLENGES:

CAUSES:

LANGUAGE BARRIER

Vocabulary Challenges:

Mathematics involves specific terms and idioms. Students might find it difficult if they are not skilled in English and Math terminology.

Grammar Complications:

Complex sentence structure in word problems can be challenging especially for non-native English speakers.

CROSS CULTURISM

Problem Solving Approaches:

Different cultures may have definite problem-solving methods. Understanding English based approaches can be difficult.

ABSENCE OF LANGUAGE SUPPORT

Limited Expedient:

In some cases, college may be absent expedient like bilingual teachers are specialized language support for students learning math in a second language.

READING COMPREHENSION

Word Problem Understanding:

Word problems often require strong reading skills. Difficulty in understanding the context can hinder problem solving.

FEAR AND IMPATIENCE

Language Impatience:

Fear of making language related mistakes can create worry, affecting the student's confidence in Mathematical tasks.

CHARACTERISTICS OF DIFFICULTIES:

MISAPPREHENSION

Word Problems:

Students might Miscontriguing the language in word problems, leading to incorrect solutions.

LIMITED EXPRESSION

Verbalizing Solutions:

Expressing Mathematical ideas verbally might be challenging, limiting student's ability to communicate their understanding.

SLOW PROCESSING

Translation time:

students may take longer to process English math instructions as they mentally translate between languages.

AVOIDANCE OF WORD PROBLEMS

Preference for Symbolic Math:

Students might avoid word problems due to language difficulties, limiting their exposure to real world application of mathematical concepts.

CONTENT COMPREHENSION ISSUE

Navigating the realm of Mathematics poses intricate challenges for non-native English-speaking students striving to grasp its concepts within an English medium educational framework. The intricacies of technical vocabulary such as deciphering term like 'integral' and 'derivative', add layers of complexity to the learning process. Syntax and sentence structure in English, demanding precision, often lead to potential misinterpretation, hindering a clear understanding of Mathematical principles. Cultural disparities embedded in word problems create additional hurdles making it difficult for students to relate mathematical concepts to their lived experiences. Moreover, the dual nature of mathematical textbooks, blending textual explanations with symbolic notations, requires a nuanced approach to reading comprehension that may impeded by language barriers.

- One of the more specific results of research in mathematics education is, according to NISS (1999), the key role of domain specificity:

> "For a student engaged in learning Mathematics, the specific nature, content and range of a mathematical concepts that he or she is acquiring or building up are, to a large part, determined by the set of specific domains in which that concept has been concretely exemplified and embedded (..) for example, even if students who are learning calculus or analysis are presented with full theoretical definition (..), and even it is explicitly stated in the textbook and by the teachers that the aim is to develop these concepts in a general form (..), students' actual notions and concept images will be shaped, and limited by the examples, problems and tasks on which they are actually set to work."

PROBLEMS WITH MATHEMATICAL OPERATIONS

Difficulty is applying mathematical processes to real world sceneries presented in English, as students may struggle with the practical application of procedures in different contexts.

- **Procedural Fluency**

  Developing fluency in applying the mathematical procedures in English can be challenging, especially when transitioning from the native language to English

- **Mathematical Notation Interpretation**

  Difficulty in interpreting and understanding mathematical notations presented in English including symbols, formulas and equations.

- **Concept Word Mismatch**

  Challenge in associating mathematical concepts with their corresponding English terms leading to confusion and potential errors in application.

- **THE CAUSE OF LEARNING CHALLENGES**

Simplification Reduction:

A large part of the research results dealing with the reason behind the difficulties discussed above can be characterized by the extensive reduction of the complexity of Mathematical concepts, processes and other sides. This was faced by the students, teachers, textbook writers etc.

Students are getting ready to answer with an ambiguous mind and this makes them boycott the formulas. For example, in calculus or in differential equations, the worked example sums are easy to solve, but the exercise sums are hard to solve. This is the major reason behind learning math.

In a historical perspective, MEGINTY et al. (1986) analyzed grade 5 arithmetic textbooks from 1924, 1944 and 1984 and found that the number of word problems had decreased, the number of drill problems had increased, and that word problems had also become shorter and less rich. VINNER (1997) suggests a theoretical framework where two of the main notions are "pseudo - conceptual" and "pseudo - analytical".

LERON and HAZZAN (1997) emphasize additional non-cognitive means of trying to cope: attempts to guess and to find familiar surface clues for action, and the need to meet the expectations of the teacher or researcher.

OPERATIONAL EMPHASIS

The most frequent type of reduction of complexity is to focus the teaching and learning that can be carried out in order to solve advanced tasks without the need for conceptual understanding or consecutive reasoning. The reason behind students focus on learning are discussed by Tall (1996) in an article on functions and calculus under the heading "procedural consequences of conceptual difficulties ".

> "When faced with conceptual difficulties, the student must learn to cope. In previous elementary Mathematics, this coping involves learning computational and manipulative skills to pass exams. One solution is to focus on the symbolic routine of differentiation and integration. At Least this resonates with earlier experiences in arithmetic and algebra in which a sequence of manipulation is performed to get an answer. The problem is that such routines become just that - routine - so that students begin to find it difficult to answer questions that are conceptually challenging. The teacher compensates by

setting questions on examinations so that students can answer and the vicious circle of procedural teaching and learning is set in motion."

SEVERAL REMARKS ON ROTE LEARNING AND MEMORY:

Rote learning involves repetitive memorization, while recalling involves retrieving information from memory. Here are some strategies to enhance recall.

- Repeat the formula multiple times until you can recite it without referring notes.
- Write the formula several times. The physical act of writing reinforces memory.
- Create flashcards with the formula on one side and the detail or application on the other and review them regularly.
- Record yourself reciting the formula and listen to it during commutes or idle times.
- Comprehend the meaning and purpose of the formula. Understanding aids in long term retention.
- Practice applying the formula to solve problems, practical application enhances recall.
- Teaching the formula to someone else tests your understanding and reinforces memory.
- Picture the formula in your mind. Visualize strength and memory connection.

ORIGINAL AND REPLICABLE THINKING

1. To understand the formula with more creative and imitative reasoning than visualizing real world sceneries where the formula applies.
2. Create visual pictures that help to memorize the formulas.

There are some alternative ways to represent the formula such as through diagrams, metaphors or even short narrative stories.

Comparison and metaphor

Draw parallel between the formula and everyday situation. For instance, if the formula involves rate, think of it as a journey and the variable as different aspects of that journey.

Story Telling

Create a story around the formula, assign a role to variables and describe how they interact in narrative. This can provide a context that makes the formula more relatable.

Physical Representation

If possible, create physical representation of the variable; this could involve using objects to symbolize each element in the formula.

Color Coding and Highlighting

Highlighting the important points in your favorite color may help your brain associate specific elements more easily.

Mind Map

Construct a mind map connecting various elements of formula. The mind map may help to boycott the formulas easily.

Explore Historical Context

Research the history or origin of the formula, understanding why and how it was developed and can provide insights into the problems. It solves and enhances your overall comprehension.

Play with variables

Experiment with different values for the variables. See how changes in one variable affect the overall outcome.

Comparison and contrast

Compare the formula with similar ones, highlighting the distinction. Understanding how it differs from related formulas can clarify its unique purpose.

Musical association

Create a rhythm or melody associated with the formula. Assign different notes or beats to variables, creating a mental song that

TEXTBOOKS AND TESTING

Represents the formula's structure.

EXAMPLE

1. Evaluate the integration.

∫(x + x2) dx

Solution

= ∫x dx + ∫x2 dx

= x2/2 + x3/3 +C

Only we can understand the problem by using formula. Without formula we cannot able to find the paper solution. First difficulty is to know the proper formula for the appropriate sum. In solution first we separate the question into simple manner and then we use an appropriate formula for an integration and the basic constant is added.

Conclusion

Only few students can pass in mathematics because of ambiguous learning. Because of poverty, some of them cannot able to study in English medium. They find some challenge manage learning mathematics in English language. This is one of the major barriers for learning English. In some Government school teaching level in English very poor. Some teachers only teaching the text and did not give the proper meaning of the text. So that students are struggling to make a sentence in proper sense. We find some ways to

The student in mathematics is decreased year by year because of learning difficulties in English having studies in Tamil medium we have not mastered English yet. We are now blocked in English language. Vocabulary word problems, written expression, use of resources, self-reflection, awareness, these are the detecting barriers. It's hard to understand the content. Here a new and interesting thing can be said in a simple way. We find some ways to overcome the challenges. They are

1. To improve the basic knowledge in English
2. Conduct test in English language.
3. Make the colleagues to communicate with English
4. Teach others what we know
5. We can be taught in a simple way that everyone can understand.

REFERENCE

1] Leron, U. and Hazzan, O. (1997). The world according to Johnny: a coping perspective in mathematics education. *Educational Studies in Mathematics*, 32:265–292

2] McGinty, R., VanBeynen, J., and Zalewski, D. (1986). Do our mathematics textbooks reflect what we preach? *School Science and Mathematics*, 86:591–596.

3]Niss, M. (1999). Aspects of the nature and state of research in mathematics education. *Educational Studies in Mathematics*, 40:1–24.

4] Tall, D., (ed.) (1991). Advanced mathematical thinking. Kluwer.

5] Tall, D. (1992). The transition to advanced mathematical thinking: Functions, limits, infinity and proof. In Grouws, D., (ed.r, Handbook for Research on Mathematics Teaching and Learning, pp. 495–511. New York: Macmillan.

6] Tall, D. (1996). Functions and calculus. In Bishop, A., Clements, K., Keitel, C., Kilpatrick, J., and Laborde, C., (eds.s, International Handbook of Mathematics Education, pp. 289–325. Dordrecht: Kluwer.

7] Tall, D. (1999). The chasm between thought experiment and formal proof. In Kadunz, G., Ossimitz, G., Peschek, W., Schneider, E., and Winkelmann, B., (eds., Mathematical literacy and new technologies, pps 319–343. Conference: 8. International Symposium zur Didaktik der Mathematik, Klagenfu.

8] Tall, D. (2004). Three Worlds of Mathematics. For the Learning of Mathematics, 23(3):29–33.
9] Tall, D. and Vinner, S. (1981). Concept image and concept definition with particular reference to limits and continuity. Educational Studies in Mathematics, 12:151–169.
10] Vinner, S. (1997. The pseudo-conceptual and the pseudo-analytical thought processes in mathematics learning. Educational Studies in Mathematics, 34:97–129.