Today's classrooms are increasingly diverse and are likely to include students for whom English is a second language. These students, referred to as English Language Learners (ELLs), come from a variety of backgrounds (both low and high socio-economic statuses), experiences (e.g., urban or rural) and educational backgrounds (e.g., years of schooling or no school experience). Clearly, meeting the needs of these students can be a challenge. How do you teach subject matter to students who may not speak the same language as yourself? How can these students learn subject matter when they do not understand the language of instruction? In addition to learning a second language, the language of mathematics presents an additional challenge.

Why might ELLs find learning mathematics difficult?

Because mathematics is itself a language, all students must learn the vocabulary, symbols, syntax and semantics of mathematics to fully understand the subject matter. As a result, all students should be considered mathematics language learners.

There are, however, inherent difficulties with the language of mathematics that ELLs might find particularly challenging as they attempt to make sense of mathematics while also learning English. Several of these challenges are discussed below.

ELLs might find it difficult to learn mathematics vocabulary because in mathematics words are used in ways that are different from their common uses in every day communication.

Consider how the following words might be misinterpreted by an ELL: table, plane, sum, and solution. When the word “table” is said as part of a mathematics discussion, an ELL might attempt to make connections based on his or her understanding of a
dining table Figure A rather than the T-chart that is actually being discussed.

Similarly, students might envision an airplane when a “plane”, a geometric figure, is being discussed. Students might be thinking of the word “some” rather than “sum” and might imagine a mixture when the word “solution” is said rather than the result for a given problem or exercise.

ELLs may also encounter difficulties when the teacher or students use a variety of synonyms (e.g., sum, add, plus, total) or pronouns (i.e., it, they, etc) to express mathematics ideas. While in the process of learning English ELLs may learn a particular vocabulary word to represent a mathematics idea, however may be stymied when an alternative to that word is used. For example, suppose an ELL is familiar with the word “add” but the teacher says, “We are finding the sum of the numbers.” Hearing this statement, the student may not know what to do. Unfortunately, the teacher may erroneously assume that the ELL does not understand the mathematical concept when he or she can in fact add, but simply did not have meaning for the particular term that was used.

**Orchestrating Classroom Interactions to Engage ELLs**

Teachers can use a variety of strategies to engage ELLs as an integral part of the mathematics classrooms. First, teachers must recognize existing language challenges and must take responsibility for ELLs’ language and mathematics development. A classroom environment should be established that encourages ELLs to utilize their language skills as they learn the subject matter. ELLs must be provided ample opportunities to read, write, listen to and use the languages (both English and mathematics) they are learning. This is only possible when ELLs are provided opportunities to interact with their English speaking peers.

To address some of the challenges identified earlier, a teacher might adjust his or her communication style to ensure that vocabulary is not a barrier. When using mathematics vocabulary, a teacher might help students differentiate between the uses of the word in social language and its particular use in mathematics. Various visual representations (e.g., concept maps, drawings, and illustrations) can be used to help support communication and assess understandings.

Other strategies that teachers can use to engage ELLs in the mathematics classroom include:

- Using tasks that encourage students to work together and discuss mathematics.
- Expressing ideas in a variety of ways to ensure that students recognize the connections among the various expressions that are used to communicate mathematics ideas.
- Using multiple representations (e.g., a word wall that connects words, pictures, and symbols) to help students connect concepts in their various forms.
- Comparing and contrasting words and concepts to help students make sense of what they are learning.
- Ensuring that classroom assessments differentiate between students’ mathematical and language abilities.

Overall, strategic plans must be implemented to ensure that ELLs have access and opportunities to learn mathematics. Teachers accomplish this by recognizing potential challenges and finding ways to overcome them so that all students, including ELLs can learn.

**References:**


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