

A Stimulating Science Vocabulary Environment

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Introduction

Student interest in science may be extended through a rich vocabulary environment. Students need to see words and experience them in an interesting way. A variety of approaches need to be emphasized for students to see words in print and relate them to the concrete (objects and items used in teaching science) as well as the semi-concrete (illustrations, pictures, and pictorial representations of reality). Words are abstractions which convey and communicate ideas. A rich speaking, reading, writing, and listening vocabulary should assist students to become increasingly science literate (See Zales and Unger, 2008).

Extending Student Learnings in Science

The interests of students need to be piqued in ongoing lessons and units of study in science. A variety of rich experiences must be in the offing, which provides for students of diverse achievement levels. One procedure is to set up a word wall in the classroom. When interesting new words are identified by students in discussion settings, they need to be printed, large enough for all to see clearly, and placed on the word wall. The writer, when supervising university student teachers, frequently noticed how learners congregate at the word wall, point to words, and discuss meanings of these words. The content for discussion may have come from reading subject matter in the basal text. Words tend to fascinate students and encourage interesting comments and use (Ediger, 2007). How might these words be used?

With readiness involved, several students wrote different types of poetry which included rhymed verse such as couplets, triplets, quatrains, and limericks. A few wrote poems containing syllabication such as haiku and tankas. Still others wrote free verse and diamantes. Students had studied each of these kinds of poems previously in the language arts and were enthused in using science words in a creative manner. They also noticed the science/language arts connection.

Pupils actively involved in sustained silent reading (SSR) was also observed in student teaching by the writer. Here, pupils chose science information and science fiction library books for the self-selected reading activity. Generally, pupils choose library books written on their individual reading level. Pupils were encouraged to do more voluntary reading, and in this case, science library books. It is difficult to say how much increase in science knowledge accrued in SSR, but the writer feels there is much to gain in subject matter content, skills, and especially attitudes in a voluntary reading activity. Not all achievement is measurable; some must probably be inferred through rational judgment (Ediger, 2007).

SSR is quite open ended in terms of being a sequential learning experience. Pupils must make many decisions on their very own in terms of which ordered books to read and quality comprehension which is desired from learners. Scaffolded Silent Reading (ScSSR) is more structured with the science teacher assisting in library book selection. When pupils read silently the chosen library book, the teacher randomly asks learners questions covering subject matter read. This is done to evaluate comprehension of science content. A pupil may also be asked to read a short selection aloud to appraise word recognition and fluency in reading. The teacher jots down a

few observations made, the date, and pupils' names (Reutzel, e. al., 2008). Progress in securing science facts, concepts, and generalizations is then noted for each pupil.

With either SSR or ScSSR, the involved pupil may keep a vocabulary notebook containing what he/she perceives to be important vocabulary terms. In small group sessions or with the class as a whole, pupils may share recorded words. Growth in science vocabularies may occur through word walls and summaries of SSR/ScSSR library book reading. Both are available for review and study. It is good to rehearse science words and vocabulary terms to improve retention as well as interest.

Journals need to be kept by pupils of science experiments performed. One part of the write-up for each experiment should be devoted to science terminology used in the activity. Each experiment needs to be clearly visible and meaningful to all in the small group as well as those taught in large group instruction. Digital pictures need to be taken of different experiments and be a related part of the write-up. Illustrations may also be drawn by pupils to accompany an experiment. Journal entries need to pinpoint key vocabulary terms used (See Allen, 2008).

A variety of rich experiences in ongoing science lessons and units of study aids pupils in securing relevant vocabulary terms which are useful presently as well as in the future. Thus, diary entries written by individuals or committees of significant learnings assist pupils to master vocabulary words. Alternating who writes the entries stimulates interest and avoids repetition and boredom. Sequential improvement, such as using complete sentences, clear ideas, and a variety of words and sentence types in all written work is to be expected (See National Research Council, 1996).

Words are powerful and can be use in a plethora of ways. Pertaining to the power of words, Wessler (2008) wrote the following:

Words are central tools of education. Whether written or spoken, words can elucidate, inform, and inspire. But they can also scare, humiliate, and disempower. Degrading slurs, jokes, and epithets are pervasive in the hallways, cafeterias, buses, locker rooms, and even classrooms of middle and high schools everywhere.

A school where degrading language slurs and jokes are widely used and rarely challenged is a place where violence is far more likely to occur. Some students will take the silence of bystanders as license to escalate their behavior from words to harsher words, threats, and finally violence. In every instance of violence that I have investigated in schools, first as a hate crime prosecutor and more recently when administrators asked me to help them respond to serious misconduct, I have seen this same process of escalation. (p. 44-48)

The above quote pinpoints the positive as well as the negative use of words. A positive classroom environment stresses the importance of using words to achieve, grow, and develop on the part of students and teachers. A threatening, negative classroom environment hinders achievement of relevant objectives in science. In the curriculum, there are many words which need to be mastered in order to become literate in the academic discipline of science. A carefully chosen video tape shown to students to introduce a new science unit of study may be used to assist pupils to acquire new concepts and words which may be jotted down. At the end of the presentation, pupils may compare their lists by having the teacher print each on the chalkboard, avoiding duplications. Word and vocabulary study are valuable for their own sake as well as for use in school and in society (See Moore and Sampson, 2008).

Concepts studied must be shown as being related to each other in ongoing science units of study. For example, in a unit on simple machines, pupils may study the uses of a lever, a pulley, an inclined plane, a screw, and a wheel and axle, among others. The science teacher must demonstrate the use of each by having real objects such as a lever, an inclined plane, a pulley, and a screw. Pictorial forms of each simple machine need to be discussed in sequence, followed by pupils seeing the related concept for each in print, large enough for all to see clearly. The relationship of words also needs to be printed in a concept web. Pupils might then refer to the concept web to review, rehearse, and assess previous learnings. It is surprising how many pupils will talk to each other about concepts on the word web as well as those on the word wall. Pupils need to think about and apply what has been acquired in order to have adequate background information and increasingly become scientifically literate (Ediger, 2006).

Classroom Environment

The classroom needs to be conducive to pupil learning. Rudeness, inconsiderateness, and carelessness for each other hinder learner progress. Relevant words and concepts need to be studied by pupils with the level of application involved. A variety of interesting, purposeful procedures must be used to engage pupils in achieving objectives in this area.

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