TECHNOLOGY for Elementary Students

By
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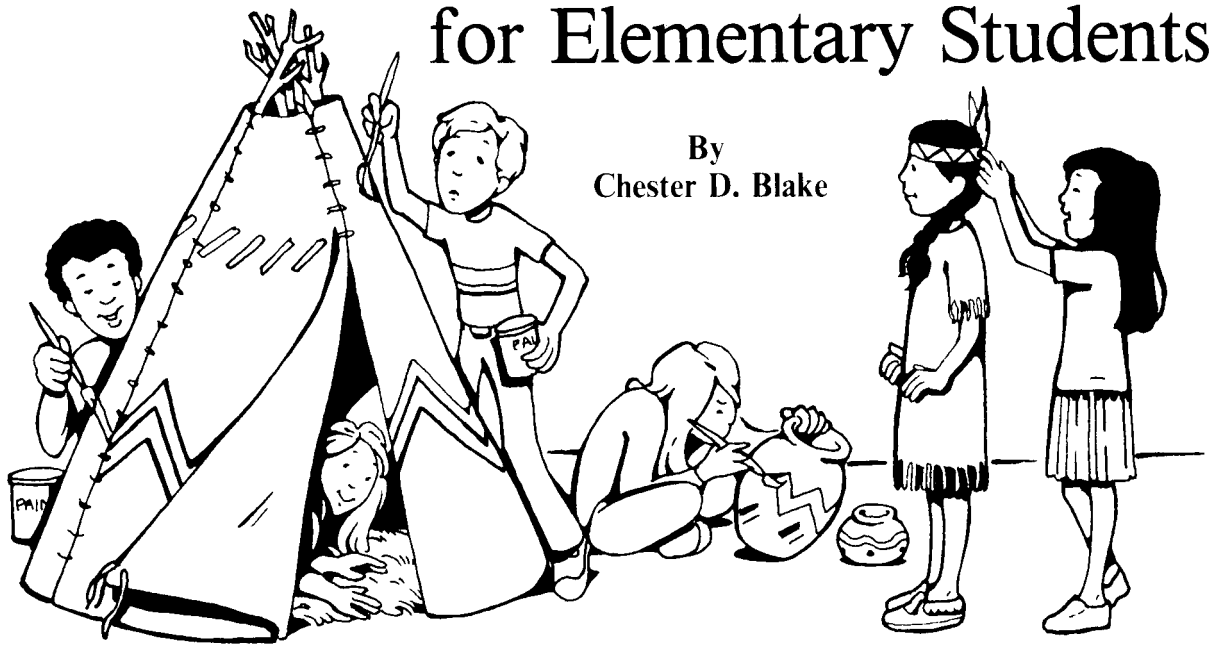

Elementary school is an excellent place to begin formal technology education. Because it helps young Christians to form an awareness of the world around them, technology education needs to be included in the "basics" to adequately prepare children for life.

Activities associated with technology include projects using industrial materials and processes with related tools and equipment. In addition, students need to learn about the heritage of technology as well as its effects upon every citizen. The topics generally covered in technology education center around the broad processes of communication, manufacturing, transportation, energy, and construction.

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Benefits and Importance

The value of technology education in the elementary school can be classified under five main categories: motivation, orientation, development, experience, and heritage.

Motivation

Technology education motivates both student and teacher. Because each child learns best in one of several learning styles, technology education can help teachers by offering a variety of methods that can enhance learning. Young children particularly need experiences that illustrate and reinforce their understanding of abstract ideas. Some subjects are not as interesting to or as easily mastered by all students. This is an area in which technology education is especially helpful. It can provide constructive incentives to explore these topics. Technology education activities make the subject meaningful, thus assisting in the learning process.

> Little learning takes place when children set passively or merely recite cold, dry facts which have little meaning for them. . . . LEARNING IS FACILITATED WHEN INSTRUCTIONAL MATERIALS AND ACTIVITIES ARE USED IN WIDE VARIETY.[1]

In addition to providing motivation through alternate learning strategies, these activities help channel the young child's pent-up energy. The transition from an active preschooler to a quiet, concentrating student is great, but a smoother transition can occur if teachers incorporate a variety of handiwork activities into their classwork.

Add Interest and Excitement to Teaching

Technology education activities can also motivate the teacher! Lessons integrated with activities that use a variety of materials, processes, tools, and equipment enrich

a teacher's job, adding interest and excitement to teaching. Classroom interaction is stimulated, making teaching more enjoyable. In addition, technology education activities provide ways for the teacher to assist pupils who experience learning difficulties. Using a variety of hands-on approaches helps provide low-ability students and slow learners with success experiences. The resulting enhanced self-image of such children makes the teacher's work more rewarding.

Orientation

The second type of benefit derived from technology education is orientation. An individual wanting to become oriented in a new city uses a map that points out his or her location in reference to the rest of the city. Likewise, students need direction in planning various activities. They must understand how each step in a project relates to other steps, and finally, to the finished product.

Often planning requires visualizing the project before construction begins. Part of this orientation includes drafting plans for the project, which helps provide a greater understanding of the activity as well as offering a way to eliminate mistakes before they become costly.

An important part of orientation is the problem-solving that technology education provides. Problem-solving aids in the general development of children because it teaches them how to reason from cause to effect.

Orientation also promotes the development of research skills. Topics being studied must be researched to provide information necessary to complete the activity.

Development

Another major contribution of technology education is development, which includes rational thinking, social skills, psychological needs, creativity, and responsibility.

The ability to think rationally is important in technology education because most of the activities require a step-by-step process to be accomplished effectively.

In order to do and project, the child must think rationally. He must plan steps in order that the project turns out as he wishes it to. He must decide on the purpose of his project, and think about how he will do his project to reach that goal. If something goes wrong, he must discover where his thinking did not foresee the possibility of that particular problem. While projects may take small amounts of rational thinking for younger children, the teacher can plan for more complex rational thinking for older children.[2]

Many social skills can be developed through technology education activities. Working in groups stimulates social growth and the development of leadership.

Physical development results naturally from handiwork activities. Large muscle control and eye-hand coordination are of utmost importance to child development. Because of this, teachers should choose activities carefully, considering the physical development of the children for whom each project is intended.

While activities need to be planned that will provide for increasing control over [large] muscles, activities which contribute to the development of greater hand-eye coordination must also be used.[3]

The child's sense of self-worth, ego, creativity, and achievement can be enhanced by technology education. The guarantee of success at various levels helps children feel better about themselves and eager to tackle new challenges.

In an atmosphere of mutal respect and serious effort, children develop a feeling of belonging and security upon which success and growth are dependent. Children value achievement and gain self-esteem through improving their own work and that of others.[4]

Technology education activities provide a host of opportunities for students to develop and try out their own ideas. Teachers should encourage this self-expression, channeling it into projects that enrich the child's understanding of the subjects in the elementary curriculum.

The teacher can encourage creativity while matching the activity to the child's abilities by adapting projects, using precut parts or assigning older children to assist younger ones.

Children develop responsibility through technology education activities by cleaning up their work areas, returning tools to their proper place, and taking care of equipment and supplies. They also learn to act responsibly when working in a group.

Experience

The fourth important benefit of technology education is experience. Since firsthand experiences are the ones that are most likely to stay with us, such activities provide excellent learning tools.

LEARNING is a complicated process through which a child responds physically, intellectually, and emotionally as a total person to a whole situation. To learn, the learner must experience; he must interact with the world in which he lives; he cannot

remain inactive. . . . Experience simply means that the learner is interacting with his environment, and that the change which takes place within the child as a result of the experience is LEARNING.[5]

Experience gives the student a base on which to form proper generalizations. Concrete activities help youngsters to understand more abstract concepts.

The manipulative, concrete activities of . . . [technology education] are especially appropriate for young children who have limited experience upon which to build abstractions.[6]

Understanding Their Heritage

Our world has an important heritage of technological development that children need to understand in order to become effective citizens in modern society.

For general education purposes this awareness should include a study of industrial developments and other technological advances within one's country, and how these affect every citizen. Such study will give students a basis on which to make informed choices about a variety of topics, such as voting on technological issues or selecting well-designed products.

Curriculum Integration

The most widely accepted and probably the easiest method of teaching technology education is by integrating it into the existing curriculum. The handiwork activity approach uses materials, processes, tools, and equipment found in technology, and creates projects to teach the subject matter of the standard curriculum.

Over the past 25 years I have discovered that many elementary teachers do not recognize the value of technology education until they have experienced training along these lines. After they learn about the innumerable possibilities that these activities present, a new world seems to open before them.

Even teachers who currently use handiwork activities in the classroom frequently limit such projects to working with paper and paper products. A teacher with adequate training will be able to use a greater variety of materials within the classroom, and will understand how to implement such projects safely.

Suggested Activities

The list of suggested activities that accompanies this article offers the teacher a place to start in planning technology education projects. Using ingenuity and resources in the community, the creative teacher will be able to involve his or her students in a host of interesting activities.

After the teacher has received some training in technology education, he or she may be tempted to limit students to games and activities that use teacher-constructed learning aids.

It is important that the children also be involved in making and creating. Activities can be planned in every subject, including Bible, to stress points of learning. A balance of learning methods is recommended.[7]

In planning activities, two factors must be kept in mind. First, the projects need to fit the age, grade, and ability level of the students involved. Projects beyond the child's ability create feelings of discouragement, while projects at too low a level will seem like busywork.

Second, technology education activities should be used to integrate a variety of subject areas, thus unifying the learning environment.

Cost-cutting Resources

Many resources are available to help the teacher implement technology education. High school industrial arts teachers and technology education professors at local colleges and universities are valuable resource persons. Local church members usually include a variety of tradespeople who might be called upon to assist.

Project ideas can be found in almost any magazine, especially in advertising. If the teacher is observant, shopping trips, visits to craft shops and museums will also suggest ideas for handiwork activities.

Technology education can be tailored to fit any budget, including that of the multigrade or very small school. It can be designed to use a minimum of tools and equipment, or can consist of a more elaborate system that incorporates a broader range of materials.

Students can bring tools from home, or church members might be asked to donate tools that they no longer use. Tools and equipment can be purchased inexpensively at yard sales and auctions.

To save on costs, materials for technology education can be scrounged from a variety of sources. Cast-off wood at construction sites and consumer product containers (milk cartons, bleach bottles, paper towel rolls, baby-food jars, et cetera) are versatile and inexpensive materials.

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added are not in the areas being recommended or developed by the industrial arts profession.

In general, industrial arts was perceived to be closely allied with the general-education curriculum, to be an important component in the educational program of college-bound students, and was seen as necessary for all students.

Few significant differences can be detected between the SDA and the public school industrial arts programs.

Neither SDA principals nor chairmen seem to be content with the current emphasis given to the purposes of industrial arts.

Seventh-day Adventist chairmen do not sense strong administrative support for their programs. The situation is the opposite for public school industrial arts chairmen. —P. John Williams. □

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evangelism. Educators must make sure that the young people under their tutelage receive good reading, writing, and speaking skills as well as the ability to use new methods of communication technology.

Conclusion

Despite the amazing advances in communication technology, unanswered questions still challenge and fascinate us. What will the future hold? As teachers, how can we prepare our students to meet the challenges that will confront them? The training of Adventist young people for the future must include an awareness of the impact of technology on their lives, and how and where they can use their skills to help finish God's work.

If the Lord sees fit to allow time to continue before His return, major changes are coming in the future of technology—changes for which we must prepare ourselves and our students. □

FOOTNOTES

[1] Edward Cornish, *The Study of the Future* (Washington, DC: World Future Society, 1977), p. 3.
[2] T. K. Derry and T. I. Williams, *A Short History of Technology* (New York: Oxford University Press, 1960), p. 216.
[3] M. Kranzberg and C. W. Pursell, Jr., *Technology in Western Civilization* (New York: Oxford University Press, 1967), vol. 1, p. 85.
[4] C. Singer, E. J. Holmyard, A. R. Hall, and T. I. Williams, *A History of Technology* (Oxford: Oxford University Press, 1958), vol 4, p. 660.
[5] D. S. L. Cardwell, *Turning Points in Western Technology* (New York: Science History Publications, 1972), p. 173.
J. Gregory and K. Mulligan, *The Patent Book* (New York: A & W Publishers, 1979), p. 71.
[6] J. W. Oliver, *History of American Technology* (New York: The Ronald Press Co., 1956), p. 433.
[7] T. I. Williams, *A History of Technology* (Oxford: Oxford University Press, 1978), vol. 7, p. 1255.
[8] M. Kranzberg and C. W. Pursell, Jr., *Technology in Western Civilization* (New York: Oxford University Press, 1967), vol. 2, p. 304.
[9] *Ibid.*, p. 307.

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Local church members are usually glad to contribute items. An announcement in the church bulletin or school newsletter will often bring good results.

Conclusion

To ensure that each technology education activity yields maximum benefit to the learner, the following steps are recommended:

1. Select the activity in terms of students' capabilities, readiness, and interest as well as its potential value to the unit being studied.

2. See that the activity is adequately planned.

3. Instruct and direct the students through successful completion of the project.

4. Conduct such summarizing activities as necessary to ensure effective learning.[8]

Christian educators have the responsibility of providing a complete education for every student. Technology education activities in the elementary school can enhance basic learning experiences in a number of ways. By introducing technology education into the classroom, a teacher can offer an exciting, stimulating, and more effective educational experience. □

FOOTNOTES

[1] W. R. Miller, and Gardner Boyd, *Teaching Elementary Industrial Arts* (South Holland, IL: The Goodheart-Willcox Company, Inc., 1970), p. 11.
[2] Ginger Ketting, "The Benefits of Technology Education in the Elementary Classroom" (Unpublished paper prepared for a handiwork activity class at Walla Walla College, College Place, WA, 1985), p. 5.
[3] Miller and Boyd, p. 16.
[4] Mary Margaret Scobey, *Teaching Children About Technology* (Bloomington, IL: McKnight and McKnight Publishing Co., 1968), p. 12.
[5] Miller and Boyd, p. 10.
[6] Scobey, p. 11.
[7] *Ibid.*
[8] Miller and Boyd, p. 34.

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training in all areas. This would be economically impossible. Each college offers some areas at varying levels of experience. For example, a person interested in studying