Teaching Values in Industrial Technology and Computer Studies

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Some school subjects seem so process oriented that teachers may conclude these courses are virtually value-free. In fact, many of the subjects that appear the least value-oriented have a wide range of possibilities for integrating faith and learning. The authors have purposely chosen two of these "stony ground" topics to show how to make the valuing process an integral part of their basic curriculum and teaching. We will consider the following areas: industrial arts and computer studies.

INDUSTRIAL TECHNOLOGY

The curriculum frameworks supplied to Australian Adventist secondary schools suggest a range of ways to teach values. These processes focus largely on teacher modeling, classroom procedures, some direct teaching, and a community service orientation.

Teachers impart values by modeling qualities such as sympathy, a well-ordered classroom and laboratory, and quality in their own work. They also elevate values by procedures they use. For example, they can require cleanliness, deduct marks for waste, provide opportunities for group cooperation, and insist on flexibility in students' thinking and planning processes. They may also develop a service awareness by having students maintain the school plant and assist the handicapped and by devising ways to make the school more caring and community oriented.

In industrial technology, even the design process invites the integration of valuing activities. Each step of the process enables a new set of values to be practiced and internalized. For example, as students refer to their objectives, they learn the value of planning and goal setting. The teacher can help them to be

- thorough in considering their planning options,
- industrious as they begin construction,

• original as they think up new ideas and tangibly bring them to realization,
• flexible as they make changes after evaluating their work,
• confident about their craftsmanship as they complete the design construction, and
• tidy as they clean up.

These values can be continually identified and taught without being labored over or formally introduced.

But what about teaching values consciously in a design process? Consider the following scenario, in which a teacher addresses values-oriented issues that emerge from designing and constructing an article of furniture from secondhand wood. The teaching approach is largely suggested through a series of questions.

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Identifying Values

Ask students, "If you go out and buy the most expensive rain-forest timber, will that ensure a better article of furniture?" To answer the question, discussion may cover the value of rain forests, the Christian's use of material resources, and the characteristics of a good piece of furniture.

Explaining Values

Discussion can focus on how we as Christians are affected by the "snob values" that permeate society and drive this competitive world. As earth's resources diminish, planners must avoid wasteful design based on status seeking. Discuss the value of secondhand materials that are often rejected simply because they are not new.

Making Value Judgments

Students make judgments as they evaluate materials and decide how to work into their design the blemishes, splits, knots, and nail holes of secondhand timber. In making these judgments, they can apply parallels to real life, learning to accept the faults and blemishes in other people.

Value judgments about timber and people often have emotive content that affects the standards held and the reasons for the judgments. What happens when we add or remove this emotional content?

Analyzing and Clarifying Values

As teachers and students think about the consequences of design decisions and what drives them, they are clarifying and analyzing values. To facilitate this, the teacher can ask such questions as these:

"If we had purchased new rain-forest timber for the project, what would have been the cost to the environment, to our value system, and to our pockets? Are we overreacting to the conservation issue? Are we turning 'dark green'? Does this have anything to do with the Christian value system?" Students can also be asked to determine whether they would use the same design criteria—the choice of secondhand materials—if the article of furniture was to be presented to external subject examiners from the state education department.

Hypotheticals

Hypotheticals invite students to follow through on the question "What if?" They can be asked, "What if you took this theme into the design and building of your own home? What secondhand materials would you use? What if you ran out of secondhand material? What would be the alternatives?"

Focusing on Issues

The issue of conservation has permeated the questions presented here for discussion. Another issue to discuss is the problems in a value system that may be created by using secondhand materials. Not all of society may be able to use secondhand materials—the poor depend to some extent on those who can afford new resources. Yet another issue is the range of motives behind the choice of materials. For example, it is possible that secondhand materials might be chosen to excuse second-rate workmanship.

Comparison

In teaching a particular design topic we can draw parallels with other times, cultures, and religions. For example, the early settlers of Australia showed great resourcefulness in using some resources, yet they abused the apparently

plentiful supply of other resources. In the first century A.D., the young Christian church developed a plan for communal use of resources that could have positive implications for our society today.

Summary

In industrial arts, the valuing process can easily focus on the rewards of applying a value system in daily life. Students can find satisfaction in conserving resources. The concept of stewardship can take on a broader meaning when applied to processes such as design. Identifying values, discussing issues, explaining, comparing, clarifying, analyzing, and judging are aspects of valuing that provide opportunities for teachers to teach and model the valuing process naturally.

COMPUTER STUDIES

Australian Adventist secondary teachers have developed a values teaching framework for another part of the curriculum which, like design technology, initially seems to be stony ground for integrating faith and learning—computer studies. Among other things, the framework lists important values, strategies for teaching these values, some key issues to consider, and a summary of how these elements of learning can be woven together.

Values are integral to computing; for example:

- Academic values such as organization and logical thinking,
- Aesthetic values like flexibility and originality,
- Ethical values such as honesty,
- Performance values such as reliability and patience, and
- Social values such as tolerance.

Strategies for teaching values in computing can be as diverse as helping students make judgments, using hypotheticals and dilemmas, developing classroom climate, refining teacher models, and presenting case studies.

As a support base for these learning experiences, there are many value-laden issues in the computing world. Consider the prospect of a cashless society, the use of computers in defense systems, computer crime, increased unemployment caused by automation, our entry into virtual reality, and the impact of computers on leisure patterns and even society itself.

Of these issues, the ability to create virtual reality is emerging as the most dramatic. As computer users gain the power to create virtual reality and interact to change their environment, they may be exposing themselves to a Pandora's box. The potential for immersion in the unreal, detachment, and escapism all raise many yet unanswered but troubling questions.

There is a seductive element to the intense use of imagination, an effect that computing technology has uncovered. This was once the domain of the arts and psychedelic drugs. Given the ability to create hitherto unimaginable fantasy and invade it, computer users may erode their ability or desire to cope with actual life. Their games may twist their long-term view of reality and present a number of moral dilemmas.

On the other hand, computers now have expanded our potential to develop creativity. Teachers will find plenty of analogies to draw between the reality of life and the rules and results of computer reality. Surely little could be more important to Adventists than their whole approach to seeing, creating, finding, and living out reality. This whole domain is value laden because we can argue that reality is in fact composed of essential values such as love, justice, relationship and law, all of which were created by God.

We will now apply some of the elements of valuing to two sets of lessons—one on setting up a data base, the other dealing with the issue of privacy.

Data Bases

Even in an apparently value-free operation such as setting up a data base, we set values and priorities. We can do this by weighing the advantages of establishing a computerized data base as opposed to using a card filing system, and through simply experiencing the whole process.

How do values emerge in this context? There are many ways to teach the value of organization, a fundamental procedural value in pursuing life tasks. One of these is to set up the data base to demonstrate organization in progress.

Other values flow from organization. For example, the time saved by creating a data base gives people the responsibility for using wisely the time they have gained. This responsibility is a fundamental life value.

Students can also be shown the benefits of being accurate in communicating with others through the process of retrieving correct data. As they place data in a confined space, they are learning to make economical use of resources.

In summary, values are present in processes such as setting up a data base, but they are often just assumed or overlooked. These values can be highlighted in passing, without major commitments of time or money.

Privacy

As we teach about privacy, we can identify many values through case studies and discussions of various issues. Examples are accountability, confiden-

tiality, honesty, stewardship of resources, and respect for property.

Discussing Issues

Privacy, like an onion, is a many-layered issue. Consider junk mail, for example. Should corporations that generate junk mail have access to mailing lists, addresses, and files from which to retrieve personal data? It is easy to see how computer use generates many dilemmas related to the issue of privacy.

Making Value Judgments

Discussion of privacy permits plenty of opportunity for forming value judgments. The following questions could be used to stimulate thought:

- Should we allow electronic media to access private records in order to send out junk mail? Why or why not? Provide evidence or standards as a basis for your judgment.
- Should employers be allowed to access medical computer data bases in order to assess the risk that job applicants will contract AIDS or certain genetic diseases?

Using Hypotheticals and Dilemmas

Sample hypotheticals for this topic include the following:

- If you could gain information illegally and sell it without being found out, would you? Why or why not?
- You are working for a bank. Someone would like a list of customer accounts over $50,000, and they offer you money for the list. Would you give them the names?

Case Studies

It is easy to find examples of computers jeopardizing personal privacy, or of people's exploitation by computer-assisted technology. For example, the media often report that telephone conversations of suspected criminals have been "bugged" by police. The calls are monitored by electronic sensing devices, often linked to some computer application that decides what to record and then stores, decodes, and reproduces the information. One such incident could be discussed in class. Are basic human freedoms violated by this computer-assisted procedure, even when it is used for a "good cause"?

Teachers impart values by modeling qualities such as sympathy, a well-ordered classroom and laboratory, and quality in their own work.

The students could also discuss issues emerging from computer technology that allows extensive monitoring of people's activities. For example, a computer can be linked with multiple sensors to constantly monitor which doors in a building are closed or locked, which smoke sensors have been activated, and which elevators are in use. Sometimes visitors must use security cards to move about the building. In the process, they are watched, listened to, and put through so many checks that their privacy and even their safety can be put at risk. In addition, some companies use computers to monitor employee productivity, counting keystrokes they enter into a computer or analyzing telephone calls made to clients. Students can explore the ethical implications of computer technology in relation to security and privacy in such instances.

Teacher Modeling

The values embedded in the privacy issue might seem hard to model, but there are applications for even such a difficult concept. One legal application centers on teachers' observance of copyright laws. Their own habits and attitudes about student copying demonstrate values about the privacy of information.

Are they casual about copying protected disks? Do they brag about not having to pay for a program or game that is copyright protected? How do they react to students' illegal copying and sharing of disks?

SUMMARY

Despite its emphasis on process, computer studies can be used to develop values and the valuing process. Like industrial technology and design, the topics and processes of computing provide endless opportunities for valuing. The judgment process, which is basic for valuing, happens as teachers help students identify values, weigh issues, and explore dilemmas and case studies.

Finally, of course, there is another variable involved in this process. Teacher modeling always has the potential to add depth and meaning to the whole valuing process.

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