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INFORMATION TECHNOLOGY AND ADVENTIST EDUCATION: OPPORTUNITIES AND CHALLENGES

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Prepared for the 28th Faith and Learning Seminar
Held at the Babcock University, Ikeja, Nigeria
17th - 29th June 2001

INTRODUCTION

This paper will examine the ramifications of Information Technology and Christian Faith. The discussion is intended to motivate thoughtful discussion by Christian scholars from various disciplines and to serve as a catalyst in the generation of ideas to be used by information technology teachers for integrating faith and learning.

It is purposed to generate dialogue and cautions rather than giving definitive answers to complex issues. From the Christian education perspective this paper offers insights and observations for integrating faith and learning which will be most relevant to appropriate classes in information technology as well as other disciplines.
This essay limits the scope of information technology the current computerised and digital information processing and transmission systems particularly characterised by the electronic information superhighway.

Statement of objective

This paper reviews the development of the foundations of information technology and its current state, then explores the opportunities and challenges it offers to the Seventh-day-Adventist education.
To understand information technology within its modern context and to understand its impact regarding spiritual matters, it is crucial to understand its historical development.

The historical development of modern information technology

The development computers resulted from ideas and inventions of many engineers, mathematicians and other scientists. The gradual development of the computerised information processing industry started in more earlier times as far as 3000BC with the abacus the original mechanical counting device.
The first time calculating machines were developed in the 1600's. In 1642, the french mathematician, scientist, and philosopher Blaise Pascal invented the first automatic calculator which performed additions and subtractions by means of a set of wheels linked to each other by gears.
During the 1830's an English mathematician Charles Babbage developed the idea of a mechanical digital computer by constructing a machine called analytical engine, which was an automatic device designed to perform complicated calculations according to a sequence of instructions.
In 1847 George Boole an English logician and mathematician devised the Boolean Algebra for representing and manipulating logical expression which later helped scientists to design switching circuits of arithmetic and logic unit of electronic computers.
In 1930 Vannera Bush an American electrical engineer built the first reliable analog device called a differential analyzer to solve differential equations. The first semi electronic digital computing device was constructed in 1939 by John .v. Atonasoff, an American mathematician and physicist.

In 1951, EDIVAC was developed into a more advanced electronic digital computer called UNIVAC (Universal, Automatic Computer). Within a few years, UNIVAC was mass provided and became the first commercially available computer. It was also the first computer system in which the operations of the input and output equipments were separated from those of the computing unit. It used vacuum tubes to rather than electromechanical relays to control its operations.

The new machines had foster productions and were more reliable. They were also smaller and less expensive than the earlier models.

The second generation computers had logic circuits controlled by transistors and memory unit composed of magnetic cores. They could process data in one-tenth the time it computes that used vacuum tubes, and magnetic drum memories.

The inucutions of new electronic equipments during the late 1960's and 1970's led to advancement of computer technology based on integrated circuits(Ics) placed on the silicon chips. These enabled engineers to design both mini computer and high-speed mainframes with tremendous capacities. Many of these "third generation: computers can carry out instructions at speed measured in nanoseconds (billionths of a second).

The Personal Computer

The first personal computers, the Altair, was introduced in 1975. Only electronics hobbyists bought these computers.

In 1977, two American students, Steve P. Jobbs and Stephen G. Wozniak founded Apple Computer Company and introduced the Apple II Personal Computer. The Apple II was much less expensive than mainframes. As a result computer became available to people other than computer specialists and electricians. Personal computers were purchased by small and medium sized businesses that could not afford mainframes or did not need the immense computing powers that mainframes provided. Millions of individuals, families and schools also bought them.

In 1981, IBM entered personal computing market with its PC. The machine was even more successful than the Apple II. Apple scored another success in 1984 with the introduction of its macintosh, a powerful easy to use desk top computer.

The introduction of more recent very large scale integrated circuit technology (VLIC) meant that as computer power increased, so did computer speed. These increases were accompanied by a steedy reduction in both size and cost. Modern personal computers are more powerful than UNIVAC and can be purchase for less.

Computers of the Future

Tomorrow's computers will be increasingly powerful Computer researcherscontinue to seek ways to develop faster and more powerful machines and software.

Much softwares research focuses on the further development of artificial intelligence which is intended to help computers make decisions rather than simply to manipulate data.

One type of artificial intelligence, the expert system, translates patterns of experience into software. An expert system responds to input by asking questions and providing responses. In this manner, it consistently narrows the field of inquiry until a solution is achieved.

Much effort also is being devoted to making computers smaller. In the near future, most experts feel that computers will continue to be built from very large scale integrated circuits. But some scientists foresee the production of biological computers, which will be grown rather than manufactured. In addition, some experts believe that computer technology will develop methods of storing data on individual molecules. A molecular storage system could contain all of the knowledge of the human race in a space smaller than a paper back book.

Development of the electronic information superhighway

It started as a network of the Advanced Research Project Agency(ARPANET) in the USA, and part of the US defense department. ARPANET was setup mainly for research purposes , however many Universities and private corporations were allowed to use it both in the USA and elsewhere.

In 1984 ARPANET was transformed into NSFNET by the national science foundation(NSF) in the USA. In 1987 it underwent a major re-organisation and upgrade, it was opened up for general use and renamed the internet. Several networks in Europe were also connected to the internet, the result has been the local, national and international networks interconnected to form an information superhighway.

Information technology and society today

Information technology can be used to enhance life in many ways. It can be used to understand God's universe to help society become more productive and service oriented and individual creativity enhanced.
Today the society is moving into what is often referred to as the information technology age. The revolutionalising force of this era is the computer, not only are the computers used in automobile, tele-communications equipment, home appliances, cameras, but also in our schools, homes, financial institutions, health care centres, research centres, politics, churches and every other aspect of our daily lives.
The situation has become more complex with the increasing global use of the internet. The pervasiveness of information technology in our lives has led to society demanding high ethical standard of computer professionals, educators and ordinary users.
There is also a negative side of information technology seen in the headlines of news papers, journals, televisions and radios reporting a growing number of computer crimes. Therefore it is clear that information technology is a very powerful tool with the potential for enhancing or destroying the society in which we live.
Despite the fact that there is a tendency to ignore God as a source of all knowledge during this modern information technology era, we can not withdraw from society to some remote locations and refuse to be knowledgeable about the use of computers, rather we need to spend time and effort to understand the computer and how to use it, communicate with and cope with society in which we live.

THE ROLE OF INFORMATION TECHNOLOGY IN EDUCATION

More than three decades ago, computers and related information technologies were introduced to educators as educational tools. Today, there are computers of various descriptions in nearly all schools in the developed regions of the world. Teachers, school administrators, government officials, and others faced with the costs involved in technology implementation must constantly evaluate the educational benefits of technology. Research or other evidence that indicates computers and advanced telecommunications are worthwhile investments for educators.

Using educational technology for drill and practice of basic skills can be highly effective according to a large body of data and history of use (Kulik, 1994). Students usually learn more and learn more rapidly , in a course that uses computer assisted instruction(CAI). This has been shown to be the case across all subject areas, from preschool to higher education, and in both regular and special education classes.

The application of educational technologies to instruction has progressed beyond the use of basic drill and practice software, and now includes the use of complex multimedia products and advanced networking technologies. Today, students use multimedia to learn interactively and work on class projects. They use the Internet to do research engage in projects, and to communicate.

The new technologies allow students to have more control over their own learning, to think analytically and critically, and to work collaboratively. This "constructivist" approach is one effort educational reform made easier by technology, and perhaps even driven by it. Traditional lecture methods are often left behind as students collaborate and teachers facilitate. Students, who often know more about technology than the teacher, are able to assist the teacher with the lesson. Since this type of instructional approach, and the technologies involved with it, are recent developments, it is hard to gauge their educational effect.

Effects of technology on student attitudes

Numerous studies over the years report other benefits enjoyed by students who use technology. These benefits involve attitudes toward self and toward learning. The studies reveal that students feel more successful in school are more motivated to learn and have increased self confidence and self esteem when using CAI. This is particularly true when the technology allows the students to control their own learning. It's also true across a variety of subject areas, and is especially noteworthy when students are in at-risk groups (special education, students from inner city or rural schools).

On-line classrooms

The Internet and advanced networking technologies are comparative newcomers to the classroom. However, classrooms around the world are getting connected to the Internet. Although a large body of research on the effects of the Internet in the classroom does not yet exist, recent studies illustrate some observed positive effects. A study by the Center for Applied Special Technology in the USA (1996) shows significantly higher scores on measures of information management, communication, and presentations of ideas for experimental groups with on-line access than for control groups with no access. Also, students in the experimental group reported significantly increased use of computers in four different areas--gathering information, organizing and presenting information, doing multimedia projects, and obtaining help with basic skills.

Importance of information technology to teachers & administrators

Teachers and administrators use computer and information technologies to improve their roles in the education process. Some examples include:

- Using computer tools to streamline record keeping and administrative tasks, thereby helping to free up time for instruction or professional development.
- Decreasing isolation by using e-mail and the Internet to communicate with colleagues, parents, and the outside world, and
- Increasing professional development activities by taking distance education courses, accessing educational research, and accessing classroom materials such as lesson plans.

Pre-requisite for a successful information technology application in educational environment

Some of the observed benefits associated with educational technology have been reviewed above, but what are the factors that help technology succeed in bringing about these benefits? Glenna & Melmed (1990) and the Technology Counts analysis suggest the following factors observed in successful technology-rich schools:

- Evidence of a detailed technology plan. Such a plan should consider funding, installation and integration of equipment, ongoing management of the technology. The plan should also express a clear vision of the goals of the technology integration.
- Support from administration. Administrative support can come in the form of funding, or in restructuring schedules and physical space to reflect the new learning environment.
- Support form the community. Parents, Businesses and Community Members can use technology as a springboard to become more involved in the activities of neighborhood schools. All can help with wiring or technical support. Parents can use e-mail to facilitate communication with teachers and administrators. Businesses can use e-mail to help mentor students and help them prepare for the workplace.

Evaluating the impact of information technology

Traditional methods of evaluating the effectiveness of educational technology present a number of problematic issues. According to Glenna & Melmed (1990):

- Most available tests do not reliably measure the outcomes being sought. The measures that are reported are usually from traditional multiple-choice tests. New measures need to be developed which would assess the higher-level skills and other effects often affected by technology.

- Assessments of the impact of technology are really assessments of the instructional processes enabled by technology, and the outcomes are highly dependent on the quality of the implementation of the entire instructional process. Crucial elements include instructional design, content, and teaching strategies associated with both the software and the classroom environment.
- The very dynamic nature of technology makes meaningful evaluation difficult. By the time long-term studies are completed, the technology being evaluated is often outdated.

Technology has been shown to have positive effects on the instructional process, on basic and advanced skills.

Technology is also changing the instructional process it self. To be effective, technology cannot exist in a vacuum, but must become part of the whole educational environment. New measures of evaluation need to be developed which would help to better define the role of technology in its winder context.

THE ROLE OF INFORMATION TECHNOLOGY IN CONVEYING CHRISTIAN INFORMATION AND VALUES.

The prolification of information technology has turned the world into a global village. The internet services are facilitating the opening up of several church related websites, where different scholars and non scholars can post or down load any information deemed important to them , for instance the; www. circle.adventist.org, www. apn.adventist.org , www.gistra.adventist.org, and other websites.
The www..circle.adventist.org refers to the Seventh-day Adventist Curriculum Instruction Resource Centre Linking Educators (CIRCLE), administered through the Andrews University school of education. It serves as a comprehensive source of information for Seventh-day Adventist educators, to enhance the teaching ministry of Christ.
The www.gistra.adventist.org refers to the geophysics institute for research website administered by the department of geophysics at the General conference to provide an information resource for the Adventist scientist and other scientist world wide.
The www.apn.adventist.org is the Adventist Professionals' Network (APN) that was launched by the General Conference to facilitate an electronic global registry of Adventist who hold the minimum of a master's degree or its equivalent in any field of study. The Adventist Professionals' Network is intended to assist the participating institutions and agencies in locating consultants with expertise, volunteers for short mission assignmentss, and candidates for positions in teaching, administration, and research.

Education massification and globalisation is exerting a lot of pressure on the existing educational resources, there is an increasing influx of students to adventist institutions of high learning around the world, indicating the need to expand our educational facilities. Although the initial emphasis for globalisation was based on economics and financial markets, education has in no way been excluded from this seemingly inevitable trend. This has necessitated the damand for more education, encouraging imitations, adaptations, and diffusion of eductional programs. The concept of a global

village apparently has many implications for the Adventist education in terms of resources, and quality of both education and the deliverly system.

The main challenge posed by the information superhighway and globalisation to the Adventist education system to day, is whether it can maintain providing a wholistic education- the harmonious development of the physical, the mantal, and the spiritual potentials of our students(white; 2000, 9). The uniqueness of Adventist education and identity of Christian institutions is of paramount importance during the era of globalisation, yet globalisation in terms of homogenisation can easly lead to loss of such identity. Therefore this calls for strategic planners being more prudent and visionary, making the best use of the latest information technology.

In view of the challenges posed by the current waves of globalisation and massification in education , there is a need for more collaboration among the Seventh -day Adventist institutions of higher learning, this will strengthen their position and help them achieve their goals. The few resources available can be fully utilised and shared among the more and less priviledged institutions. Adequate consultation is also necessary if we are to fully integrate faith and learning , all this can be possible with the utilisation of the contempolary information technology.(Kibuuka; 2001).

The internet can provide alink between Christian institutions in different parts of the world, libraries and other information sources. This facilitates the possibility of sharing the scarce information resources to the benefit of all the institutions.
Universities, colleges, and schools can interlink their programs, and specialisation is possible. Both teachers and students in our institutions across the globe can share their experiences and consult each other on several professional issues such as the integration of faith and learning.
The digital information technology has facilitated global satellite evangelism which ensures reaching out to many remote areas which would otherwise have remained for so long. The same technology if widely used can enhance the distribution and sharing of other types of educational information and news among our institutions across the globe and also to the general public where necessary.
The world bank currently is running several global distance education centres in many parts of the world, this has facilitated the education of many people within their local environment yet at a low cost. Video conferencing has facilitated discussions and sharing of ideas on many issues affecting the world without incurring a lot of costs and inconvinience, it is inevitable therefore for the church to take advantage of such tremendous developments in information technology if it is to cope with the challenges of the information age.

Large volumes of information can easily be moved between places and made accessible to many people in need of it through the use of CD-ROM technology, instead of using bulky books, for instance a CD-ROM record of E.G.White books is far cheaper to transport than the 54 or more books in a printed form.
The e- mail services provide a tremendous challenge for personal ministry for instance through words of encouragement or compassion and providing guidance and counselling to those in need of it. Both teachers and students can make a positive influence on other peoples lives which may lead to their salvation.

It is of paramount importance that scholars in the developing world particurlary in Africa become aware of the potential benefits of fully embracing and utilising the new information technology to facilitate our professional and institutional growth and development.

ETHICAL ISSUES IN INFORMATION TECHNOLOGY

Information technology gives us a host of ethical challenges. There are ethical questions about unemployment created as the direct result of the inputs of computers in the work place, government secrecy, encroaching on personal privacy, computerised weapons of war, computing for persons with disabilities; ownership of intellectual property, the replacement of human decision making by computers, and many other ethical issues.

Computer technology especially the internet has provided a new forum for certain illegal activities for instance certain crimes invloving software piracy, pornography, electronic break-ins, and computer sabotage.
New technology poses new implications for the balance of power in the work place. Workers conduct personal business in the office and professional business at home. The office usually provides faster, cheaper and easier access to the internet, while some work must be done at home in order to be completed according to our modern, technology enhanced pace.

Should the technological ability to find something out make it relevant? With new employment-testing technology, you can find out all sorts of personal information. Through genetic testing, hair follicle testing, drug testing, your employer can find out anything he/she wants to know about you. Similarly here, should the employer find out the information simply because she/he can?
In addition, new technology allows for more faceless communication. If you have to fire some one, it is significantly easier to fire that person by e-mail than to walk into her or his office. It is a lot easier to be nasty when you do not have to look your stakeholder in the face.

Ethical issues in privacy arena arise with the gathering information, assessing its accuracy, collecting it and disclosing it, as well as issues related to the substance of the information itself. Do you personally, care about the information others know about you? Would you care if your boss knew of all your off-works activities?

In one recent case in U.S.A., two Mac Donald's restaurant employees used voice-mail to transmit love messages during an affair. They believed that these messages were private since the firm told them that only them had the access codes.

The franchise owner monitored the voice-mail messages and later played messages for the wife of the worker. The lovers' sued for invasion of privacy. They settled for several million dollars, so we do not yet have any judges' decision in a situation like this.

The status of new technology with regard to work place privacy, a number of basic and inexpensive computer monitoring products allows managers to track web use, to observe down loaded files, to filter sites, to restrict access to certain sites, and to know how much time you have spent on various sites. The monitoring software or products include web sense, new access managers, web tracks and internet watch dog.

Spy zone computer sells an investigator bit, which includes a truth-telling device that links to a telephone. It identifies those who lie during an interview.

Computer technology especially the internet has provided a new form for certain illegal activities for instances certain crimes involving pedophiles drug traffickers, child pornographers and cyber-stalk

which are not strictly speaking computer crimes despite the fact that computer technology was a means used for carrying out those criminal acts.
The additional problem in determining crimes involving computer technology is that many ethical issues associated with computer crime also border on distinct, but related issues involving intellectual property, personal privacy and free speech in cyber space.

There are basically three categories of information technology crime or computer crime.

1. Software Privacy:- Using computer technology to;
   (a) Produce one or more un authorized copies of proprietary computer software.
   (b) Distribute un authorized software or make copies of that software available for distribution over a computer network.

   Example:
   Distributing of MP3 files (copyrighted material) on the internet via the Napster Web site.

2. Electronic Break-Ins: - Using computer technology to gain an authorized access either to an individual or an organization's computer system or to a pass-word-protected web site.

   Example:
   Hackers succeeded in breaking into the U.S. government and military computer system in the recent past.

3. Computer Subotage:- Using computer technology to un leash one or more programs that;

   (a) Disrupt the flow of electronic information across one or more computer networks, including the internet.
   (b) Destroy or damage data and computer system resources.

   Examples:

- In the recent past there was unleashing of the "Love bug" computer virus via the Internet.
- "Attacking", commercial Website so that they will issue denial of service requests.

All the various types of crimes and other issues such as the unemployment and the impact of computers in the work place, government secrecy, computerized weapons of war, computing for persons with disabilities, ownership of intellectual property, the replacement of human decision making by computers,present a lot of ethical question for the society today.

According to Wiener (1950) these are "hot topics". He said "A person will not leap in where angels fear to tread, unless he is prepared to accept punishment of the fallen angels, neither will he calmly transfer to the machine in his own image the responsibility for his choice of good and evil without continuing to accept a full responsibility for that choice".
At a time when computers are being used for tasks that include medical diagnosis, air-trafic control, the monitoring of nuclear power plants, deciding to sell stock on the stock market, controlling life support system and educational tutoring, it is understandable why it is so vitally important that the computer professional have high moral and ethical values.

This is an exceptional opportunity for the Christian educator to integrate faith in the computer science curriculum. This can best be done by discussing ethical dilemmas or concerns in relation to his or her Christian world view and integrating these Christian values in the context of various class assignments as opposed to teaching a separate computer ethics class.

The limitation of the legal system and a call for Christain ethical values

The Law offers little, if any, guidance in the area in connection with work place monitory, and technology as a whole. In fact, the development of our moral systems has not been able to keep pace with technological and medical developments leaving us prey, individually and as a society, to host of dangers. As Law does not yet provide answers, we turn to Christian ethical values for guidance.

INFORMATION TECHNOLOGY AND CHRISTIAN VALUES

Values may be broadly defined as the established ideals of life that the members of a given society regard as desirable, noble and honarable. Values involve concepts such as, good, bad, desirable, beautiful and ugly. They are concerned with what is ethical or moral.
The Christian values fall under this broad definition, as it is concerned with the principles reflected, in the life and teaching of Christ. The law of love for God and fellow human beings provides the ideal frame work for Christian values.

The true reflection of Christian faith is in the values they practice, however all these values should be practised out of genuine love for God and fellow human beings.
Teachers or instructors in information technology need to develop a Christian value teaching frame work. Such a frame work would outline important values integral to information technology and the strategies for teaching these values.
Some of the key values to consider include;

- Academic values such as organisation and logical thinking.
- Aesthetic values such as flexibility and originality.
- Ethical values such as honesty, moral integrity, flexibility in moral judgement, self-discipline, and justice.
- Performance values such as excellency, accuracy, diligence, panctuality, service, reliability, and patience, and social values such as humility, kindness, temperance, obedience, tolerance, forgiveness, and love.

Teaching of values is of fundumental importance since the students who have been recipients of a christian education, on leaving the institutions of learning, are expected to enter the world and live exemplary lives. The values taught are expected to permeate their lives in the home, the church, and the society in which they live. Ethical theory is concerned with providing right values as the foundation for right actions(George Knight,1989).

A distinction can be made between ethics in general and christian ethics in particular. As far as ethics is concerned, a student can make a dicision based upon values, but the goal of christian education would be for its students to make dicisions and live their lives based upon christian values as they are expected to be representatives of christ. The christian therefore make dicisions which not only demonstrate respect and love for their fellow man, but also reflect a desire to honour and glorify God, which is one's Christian and moral responsibility.

The Christian of necessity would make all decisions fully aware of the eternal ramifications; situations would be viewed from an eternal perspective, success and failure to the student of Christian education would therefore not be limited to outcomes for this life only, but would instead be viewed towards obtaining eternal success-salvation. The students of this Christian education should incorporate their special and specialised training into their general lifestyle and decision-making. The ethical training and guidance to which they have been exposed in schools become their guide to setting and

maintaining high standards in their work. The teachers must remember that in this sense, teaching is relating to the master teacher in such away that, they become agents in the great plan of redemption.

STRATEGIES OF TEACHING VALUES THROUGH INFORMATION TECHNOLOGY

The strategies for teaching Christian values in information technology may include helping students to make judgments using hypotheticals and dilemmas, developing an appropriate classroom climate, refining teacher models and presenting case studies.

Hypotheticals help students to look at different scenarios as possibilities, what would be the result of taking alternative decisions? For instance should an individual access private information and sell it for money? In a situation of free access to the internet should you access pornographic websites simply because you have access to it?

Hypothetical situations and dilemmas reflecting the real situation in life when given to students for discussion can go along way in preparing the young people for the real challenges in the information world. Case studies on topics like software piracy, enchroachment on personal privacy, electronic breack-ins and computer sabotage provide opportunity to the instructors to guide the students explore the ethical implications of such situations.

Discussion of such issues regarding the use of the information superhighway and other aspects of information technology allows for greater opportunities for students to form Christian ethical value judgements. For instance a discussion question as to whether it is justifiable for the employers to 'bug' the private messages of their employees using the modern sensing devices, can stimulate debate on what a Christian employer should do in such a situation . There is need to enhance the students ability to make ethical decisions.

The ethical process of decision making

Too often we miss out on the best possible decision, making instead the earliest possible decision. It may appear awfully complicated. It will be challenging or burdensome in the beginning, but later it will evolve into a habitual process.

The steps in Ethical decision making process are as follows;

1. Issue(s): Identify the dilemma.

2. Facts: Obtain all of the unbiased facts.

3. Alternatives: Identify the choices that you have (look not only to "A and B" but also to "y and Z").

4. Stakeholders: Identify those who have an interest. What is their motivation? How much does each hold over you and your firm?

5. Impact: Identify the impact of each alternative on eachstakeholder and the stakeholders resulting impacts on you or your firm.

6. Additional Assistance/the vertical guidance: Do theories uncover any hidden implications. Do they support one alternative over another?

7.

7. Action: Decide how to respond and act.

8. Monitor: Monitor out comes and make adjustments where necessary.

There are some few questions that you might ask yourself to gain a bit of guidance or direction.

1. How did I get in this dilemma in the first place?
2. Is my action legal? Where is the legal line?
3. Am I being fair and honest (is it just)?
4. Am I acting in line with my personal integrity? With the character traits and values I endeavor to exhibit?
5. Am I being self-serving or am I considering others?
6. Will (my action) stand test of time?
7. Is this a model of "right" behavior?
8. How will I feel afterwards (am I proud)?
9. Will someone get the wrong idea?
10. Is my loyalty in the right place?
11. Is this something a leader should do?
12. How do I never get here again? What should I have done a while ago to avoid getting to this horrible place?

There are many learning experiences that can be used to promote Christian values in information technology World. Information technology has uncovered the use of intense imagination, once the domain of arts.

Through the computer hardware engineering practical lessons and the teaching of the different components of the computerised information system, the teacher can draw illustrations from the natural systems in God's creation. For instance the human brain can be related to the way the central processing unit operates. Aesthetic values such as originality, creativity, design, and harmony, can be discussed in class.
By examining the underlying principles, there is an opportunity to focus the stundents attention to the master designer of nature and the natural laws as the source of information technology designs.

The values of excellency, service and reliabilty can be integrated in the students learning experiences when comparing and contrasting the computerised data processing system and a manual data processing system.

Computer programing lessons can provide extensive opportunities for the teacher and students to discuss and reflect on a veriety of academic, aesthetic, social and Christian values, such as originality, flexibility, organisation and structure of ideas, precison of language, planning, independent thinking,

critical analysis, reason, patiency, orderliness, and obedience. There is a lot of illustrations and experiences from the natural environment that help the teacher to focus the learners attention to the master programmer of the universe . For instance the elements in the solar system operate according to certain natural laws which makes a harmonious co- existence possible.

In view of the maginititude of the ethical challenges presented by the information technology era, it is innevitable to integrate high moral and ethical values in our computer courses or curriculum.

The teacher can help students to explore and discuss the ethical challenges of information technology in relation to several issues such as information security, personal privacy, intellectual property ownership, through different case studies and hypothetical dilemmas. This can help the teacher and students to identify and highlight certain Christian values such as acountability, moral integrity, sincerity, honesty, torelance, patience , confidentiality, being faithful stewards of resources, love and respect for others and their property and flexibility in moral judgement.

A classroom discussion of the ten commandments of computer ethics proposed by the Computer Ethics Institute provides a forum for the Christian teacher to integrate Christian values in the learning experiences. For instance ethical sensitivity, justice, trustworthness, duty, self-discipline, and ability to exercise judgement in reaching conclusions.

When the teacher conducts a lesson on computerised communication methods in emphasing the proper use of the internet and the e-mail in particular there is an opportunity to promote Christian values such as compassion, humility , patience, and love, towards others.
Students need to be aware of the immeasurable opportunities available for some body to show gracefulness and compassion to so many people through the information superhighway. There malititudes in need of frienldly, encouraging and positive messages , the way we respond to messages or communication from other people should reflect humility, patience and love to others,cheerfulness, sincerity, and ethical sensitivity.
Sometimes we may not be able to access the website of our choice at all or it may delay, such experiences provide wonderful opportunities for learners to reflect on values such as intellectual tolerance, kindness, faith in God, and moral integrity.

While teaching software packages, which involve following the menu or commands, the teacher can impart social and Christian values such as obedience, accuracy, patience, deligence and humility. It is also possible to stress on academic values like intellectual curiosity, and critical analysis, aesthetic values like creativity, design, harmony, and diversity.

Both the teacher and the computer laboratory techinician provide models for the students to emulate, for instance in the way they conduct themselves when using both the hardware and software. Their attitudes towards issues like personal privacy, intellectual property rights, and data security.

The way they organise their work and the teaching environment can promote such values as organisation and structure of ideas, intellectual honesty, a wholistic life style, temperance, moral integrity, trustworthness, faith in God, patiency, tolerance, and love in the classroom.
The ability to model before students everything Christian, contrasting the contemporary perspective with the eternal is very crucial. In a Christian school it is a teacher who helps the student connect with and filter ideas within a Christian worldview. These Christian values and many others will foster a closer relationship with God and with fellow human beings.
The habits and principles of a teacher are of great importance, than his literary qualification. He must feel the necessity to have a balanced interest in the physical, mental, spiritual, experimental and social education of his or her students.

To exert the right influence a teacher must have perfect control over himself and his own heart should be richly imbued with love for him. By the time the young people come to school they have lived several years in a home and they have been influenced by the values of the family and the community. But they are still establishing their own personal values and can there fore be influenced by consecrated teachers at all levels of schooling.
Studets are most apt to respond to the value system that their teachers have lived and less likely to respond to what is told to them. Educators need to model the same choices and behaviours that they want the students to carry out. By using the same skills and making positive choices, we show students that real people use particular strategies when they work. They need signifcant choices to practice the skill of choosing and feel they are in control of their lives, the more the students believe they can make real choices that affects their lives the more they may feel capable of selecting good alternatives.

Information technology and the integrating of faith and learning

Once we accept that all truth is God's truth, we have to commit ourselves to facilitating the transmission of information about the truth. However it is also our responsibility as christs agents to pass on Christian values such as ethical sensitivity, hope, trustworthness, moral integrity, kindness, thankfulness, stewardship, temperance, self-control, a wholistic life style and faith in God. This is possible through a careful and deliberate effort for it in our curriculum planning and implementation at all stages of the teaching and learning process.

Integrating faith and learning can take place on an individual level ie the teacher (Gaebelein 1968). Christ in his teaching dealt with men individually. The same personal interest, and attention to individual development are needed in education work today. In this process the teacher is the facilitator. His main task is to inspire and equip the individuals to think and act for themselves in the diginity of persons created in God's image (Holmes 1975:6). One of the ways this can be done is through making available the information needed by certain individuals in order to help them overcome social, emotional and behavioural problems.

The purpose of information technology includes:Imparting of information, providing insight, stimulating discussions about problems, communication of new attitudes and values, teaching new solutions to problems; enhancing self-esteem, furnishing relaxation and diversion (Coleman & Ganong 1988).
Information Technology properly used in the educational situation, can have a positive effect upon personality. It helps individuals to solve personal problems and concerns, expanding the potential for growth and development and providing instructions, knowledge, understanding and inspiration.

CONCLUSION

The recent progress in the electronic information superhighway has both positive and negative implications for the Adventist education system. It would be wrong and hypocritical to denounce all the progress made in the electronic information superhighway as bad, but the evidence of computer addiction cannot be denied as there is a growing number of young people with high intelligence quotients but very little value judgement and un able to cope with life and its complex issues. The teachers challenge is to integrate Christian values in the students learning experiences.
The major function of Information Technology is mediation between the student and information sources. This function is of critical importance to the academic program. Students are taught the research skills essential to a quality education.
Our education philosophy emphasises the concept of Christian Education of "wholeness" in education, It concerns with the growth and maturity of the whole person. The second concept is that of education for life-preparation for the years beyond formal schools. The teaching of Christian values is of fundumental importance since those who receive a Christian education, on leaving our institutions are

expected to enter the world and live exemplary lives. The values taught are to permeate their lives in the homes, the church, and the society in which they live.
Information Technology postively used, may find creative ways to support the Christian objectives of the institutions as well as providing services to both campus and off-campus communities. Unique opportunities exist to promote a Christian world view.

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APPENDIX A

The Ten Commandments Of Computer Ethics

1. Thou shalt not use a computer to harm other people.
2. Thou shalt not interfere with other people's computer work.
3. Thou shalt not snoop around in other people's computer files.
4. Thou shalt not use a computer to steal.
5. Thou shalt not use a computer to bear false witness.
6. Thou shalt not use copy or use proprietary software for which you have not paid.
7. Thou shalt not use other people's computer resources without authorization or proper compensation.
8. Thou shalt not appropriate other people's intellectual output.
9. Thou shalt think about the social consequences of the program you are writing or the system you are designing.
10. Thou shalt always use a computer in ways that insure consideration and respect for your fellow humans.

APPENDIX B
ABBREVIATIONS

IBM; International Business Machines

PC; Personal computers

UNIVAC; Universal automatic computer

EDVAC; Electronic discrete variable automatic computer

ARPANET; Advanced research project agency network

NSFNET; National science foundation network

CAI; Computer aided instruction

CD-ROM; compact disk read only memory

WWW; World wide web

VLIC; Very large scale integrated circuit.

APPENDIX C
CIRCLE

Advanced Search

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About CIRCLE The Seventh-day Adventist Curriculum and Instruction Resource Center Linking Educators (CIRCLE) is a service provided by SDA sponsoring organizations. CIRCLE is administered through the Andrews University School of Education located in Berrien Springs, Michigan, USA.

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