

Institute for Christian Teaching  
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INCREASING FAITH THROUGH BIOLOGY INSTRUCTION

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## Introduction

Of all the scientific fields, biology is one of the most important branches that can be used in increasing faith, primarily because it deals with the study of living things, the magnificent creation of God. To study biology is to study an important part of God's creation. (Wright, 1989, p. 5) The living world is a manifestation of God's creative power.

The integration of faith in the teaching of biology will equip the students with scientific concepts and principles as well as develop in them a deeper appreciation of God's work and love for mankind. It is a great challenge to every Christian teacher of biology to produce not just scientifically literate but also God-fearing and loving individuals.

This essay is written to provide some ideas in integrating faith and learning through biology instruction. It is addressed specifically to the biology teachers in the high school and college levels in whose hands are entrusted the development of a generation of individuals with scientific skills and Christian world view. Isaac Newton believed that the method of science could and should be used to demonstrate the existence of God. (Mutch), 1987, p. 17) So, it is important that biology teachers seek ways of integrating the knowledge of God into course content. Such task may not be easy but once accomplished, it will be rewarding not only to the teachers themselves but to the students as well. It will surely make a lot of difference in the Seventh-day Adventist science program which will distinguish it from its secular counterpart.

## Rationale for Teaching Biology in a Seventh-day Adventist Institution

Through the study of biology, the students will be led to discover the diverse forms of life and appreciate their structure and functions. They will gain a better understanding of their own bodies and their care. Not only would they realize the economic values of plants and animals but they will have more respect for life in whatever form it may exist as so designed by God. This discipline will develop among students a concern for the environment, making them good stewards of Mother Earth.

In a Seventh-day Adventist institution, the teaching of biology must be based on the following premises:

1. God purposefully created everything.
2. God's creation reveals His love and power.
3. Creation is dependent on God for existence.
4. The whole natural world is an interpreter of the things of God.

The science of biology is a vast avenue for unlocking the wonders of God's creation. The study of living things will open the minds of the students to the ultimate truth that man and all the living creatures on earth are not products of chance or accidents but are special creation "kept in order and activity by the power of an infinite God." (White, 1905, p. 417)

### A Partnership Between Faith and Science

The integration of faith into the science curriculum poses a great challenge. An education that "honors and exalts the wisdom and knowledge of God" (White, 1923, p. 415) is what each Seventh-day Adventist institution is expected to provide the students. If this is done effectively, the school can help attain the church's mission of spreading the gospel to the people. The pursuit of academic excellence will be accomplished much easier if God is acknowledged in every way.

Today's age of modern science and technology finds the science education in the midst of controversy between modern science and the Bible. The development of new scientific thought and philosophy threatens the religious faith. For instance, science has rejected miracles described in the Bible. (Roth,, 1987, p.5) Even man's perception of life has been changed by technological development.

There is a general belief that faith and science are two divergent disciplines. It is based on the assumption that most scientists do not believe in God. On the contrary, pioneers of the scientific world referred to God as the Creator. Scientists like Newton, Linnaeus and Agassiz believed that the investigation of science would lead them to discover the cause-effect laws that God had created. However, these devout men of science were replaced by atheists or at least anti-Christian bent of mind. (Ramm, 1954, p.18) These, in turn, influence the minds of the students taking science course.

A close partnership exists between science and faith. Both are fundamental pursuits of searching for truth. Through repetitive experimentation, a scientific truth may be arrived at. On the other hand, the absolute truth is achieved by believing God's word, by believing that what God says is true. (Thurber, 1947, p.9) It is through faith that progress in science is attained because scientists were determined to do a thing whatever the difficulties may be. It is faith that Christians have to hope in the things not seen and to believe that the world was created by the words of God.

One cannot overlook the fact that science and technology, its application, had changed man's living condition. Man can now enjoy the comforts and convenience of life brought about by scientific inventions. He should thank

God for giving those scientists the skills and mind to invent and discover new things to make life a little bit easier. Recent discoveries brought tremendous changes that can shock even those scientists who lived in the past. But the wonders of these inventions will go to nothingness if man will not be wise enough to use them for peaceful means and if God will not be glorified for every discovery and invention that are made. As one writer pointed out:

A technology that ignores or disregards the questions of Christian ethics, especially the value it places on man will quickly reduce the earth into a desert, the person into an automation, brotherly love to planned collectivization, and introduces death where God wishes life. (Shinn, 1979, p. 49)

A true scientist should work in humility and reverence believing that he is delving into the workshop of God. (Ramm, 1954, p. 35) It is his privilege and honor to be given such opportunity to use his talent to discover and understand God's truth through the things He created.

The knowledge of God is the beginning of wisdom. It is this knowledge that will enable the students to understand and appreciate scientific concepts even better. Science instruction in an Adventist institution should point to God as the creator of all things and must aim in producing individuals who are believers of God's message and revelation and are prepared to face the challenges of this life and the life to come.

In this essay, there are three aspects which will be considered in relation to the integration of faith in biology classes. These are the teacher, the subject matter, and the strategies of teaching. The subject matter is divided into themes like: evidence of God in creation, position of human beings in the living world, care of the environment, care of the human body, and bioethics. There are other significant themes which can be included but the writer considered only those above-mentioned topics which are believed to be more relevant to both teachers and students.

### Teacher's Role

Teaching is the noblest of all the professions and teachers pursue the greatest work in the world. One who prefers to teach is sincerely committed to train and nurture young minds with knowledge, skills, and values that will prepare them not only for citizenship in this world but also for eternity.

An effective teacher possesses the skills in planning and designing lessons to stimulate the students and to make them more involved in the classroom activities. He assesses

the needs of his students before setting his goals and objectives. Furthermore, he selects and adapts suitable materials to allow his students to engage actively in the teaching-learning activities.

Teaching is more than writing lesson plans, giving lectures and tests, and marking exam papers. It does not merely involve imparting knowledge. Warmth, sensitiveness, and enthusiasm are important qualities of an effective teacher. An enthusiastic teacher enhances the students' interest in learning and keeps a lively classroom atmosphere. A warm, loving, and caring teacher interested in the students' welfare has a capacity to provide a perspective that gives real meaning and purpose to science education. (Keller, 1987, p. 26) A teacher's pleasing personality that radiates love and understanding can bless the students and make them experience God's love.

Teachers are faced with the tremendous tasks of shaping the human mind and teaching the truth. A teacher can pass on to his students not only his knowledge of the subject matter but also his knowledge of and love for God. He can help his students to choose between right and wrong by guiding them in the path of righteousness. Through the teacher's work, the students will understand that the word of God is a "lamp unto our feet and a light unto our path." (Ps. 119:105) The Christlike characteristics and attitudes he possesses serve as a good model to students wanting to become true and good Christian. His positive attitude toward God can develop among his students similar attitudes as well. Christ must be brought to the classroom for He is the foundation of knowledge and knowing. "A Christian mind begins with a Christian attitude." (Sire, 1990, p. 15)

In his essay entitled "A Christian Approach to Biology", Gibson (Gibson, 1993) pointed out some of the roles of a Christian biology teacher. He said that a Christian biology teacher:

1. Shows his students how to interpret nature from a biblical perspective.
2. Points to his student the wisdom and power of Creator.
3. Guides them to respond appropriately to the problem of environmental degradation.
4. Teaches them to treat other creatures with concern.
5. Promotes healthful living and emphasizes the care and wisdom of the Creator.
6. Provides a basis for each student to realize that he was created by a God who has a purpose and plan for his life.
7. Imparts to students an understanding that will strengthen their Christian faith.

Christian biology teachers need to keep themselves abreast not only with the latest scientific discoveries or biological breakthroughs but also with the words of God to learn of God's will and ways and to impart this knowledge to the students.

### Nature of the Subject Matter

Science is defined as the study of nature. It is "nature that speaks to us of the Creator's love." (White, 1892, p. 9) From the Seventh-day Adventist perspective, science is:

1. The continuing search for understanding about selves, the changing physical, technological, and biological environment. It must be consistent with the ultimate truth which is embodied in God, who is as yet only glimpsed by man.
2. A set of processes which facilitates the systematic acquisition and refinement of data.
3. A way of viewing of life. It involves attitudes and values and is a way of thinking about man's interaction with his environment and with God.  
(SDA Secondary Curriculum, 1990, p. 4)

According to Wright (Wright, p. 50) there is one good reason for doing science:

God has given us the responsibility of developing culture, of learning to use the creation responsibly to form a human society that will express all the good potential that exists in both the human mind and in the creation.

The study of biology brings the students closer to nature and enables them to marvel at God's creation. The exquisite beauty and variety of a myriad of plant and animal forms and the intricate capability and versatility of the human mind constitute a brilliant and awesome display of the products of divine handicraft in God's infinite workshop. (Hoen, 1951, p. xi)

### Evidence of God in Creation

The Bible said that nature was perfectly created by God who was the Designer, Architect, and the Fabricator of the things in Nature. God is also the source, the Originator of the materials of which those things were made. (Hoen, p. 5) He did everything perfectly. One can examine and note the exquisite beauty of a flower or a sea shell and will be amazed at the designs of which they are made.

The evidence of a Creator is clearly seen in nature. By God's word everything was made good. The whole natural world is designed to be an interpreter of the things of God. (White 1913, p. 186) It is full of lessons of love of God. The earth was filled with beautiful things, an expression of God's love for man. The creation of living things outweighs the formation of the physical features of the earth and sky. To make the earth habitable, he introduced vegetation, after which He gave life to animals.

The plan and design of each particle of a living tissue is far unique and elaborate for chance origin. (Hoen, p. 30) The processes occurring in the body of living things are revelations of the Lord's dependable character.

Take for example a single cell, the basic unit of living things. Inside it is a "highly sophisticated and diversified factory, containing precision machines so delicately tooled and intricately regulated and can only be a product of incomparable Intellect whom we call God." (Utt, 1971, p. 37) Each cell contains molecules which provide instructions in order for life to exist. The complex chemical operations of a cell are evidence of God's creative wisdom and power and the more an individual studies the complex reactions of the cell, the more his understanding of God's wisdom increases. (Gibson, p. 3) These facts of molecular biology prove that there is God, the greatest Engineer.

Another evidence that speaks of God's design is photosynthesis, the most important process on earth. It is the process by which plants manufacture food and produce oxygen essential for the survival of man and animals. Each step involved in the process starting from the trapping of the radiant energy to chemical energy by the green cells of the plant reveals orderliness in design and function. The complexity of photosynthesis confronts man with overwhelming evidence that as one studies plant life, he is following the steps of the Infinite God. (Utt, p. 45)

The activity displayed by the growing plant can not just be attributed to the presence of soil, air, and water. It is God who makes things grow. By His provision of seed and soil, sunshine and showers and through the marvelous laws of heredity that He established, the plants continue to reproduce after each kind. (Hoen, pp. 34-35) Every seed sown produces a harvest of each kind.

Designs in nature are evidences of the Great Designer. Whosoever denies such design denies the existence of God, the creator of heaven and earth. However, one should not regard nature as God. Nature is but an expression of God's character, thought and power. The things He made should not be venerated or worshipped. It is He, the Creator, who must be exalted for His handiwork. He made every thing good

through His commands by His word. The beasts in the forests, the birds in the air, the fishes in the sea, the roses and the thistles and everything seen on earth declare the mighty creative hands of Omnipotence.

### Position of Man in the Living World

On the third day of creation, God remarkably formed the first living things, the plants. During the fifth and sixth days, His word brought about into existence the first animals of land and sea. He endowed these creatures with greater functional abilities than those given to plant life. These were provided with sensations, mobility, habits and instincts suitable to their existence. But the crowning glory of God's work is man whom He created in His image. Genesis 1:26, 27 describes how He created man:

Then God said, Let us make man in our image after our likeness; and let them have dominion over the fish of the sea and over the birds of the air, and over the cattle, and over all the earth, and over every creeping thing that creeps upon the earth. So God created in His image, in the image of God created he him, male and female, created he them.

Man was perfectly made. When God breathed into Adam's nostrils, He gave him life not shared by the animals. He made him the first living soul, the first intelligent being who was given the power to rule over the earth. Man became the highest member of God's creation on earth, in charge of the garden of Eden.

Man's likeness to God is spiritual, moral, intellectual and physical. Adam and Eve were endowed with high mental and spiritual gifts. They are capable of understanding moral responsibilities and obligations. They also possess some of the attributes of their Maker.

Like the rest of the animals, man has needs for food and others. He was placed in the Animal Kingdom because he shares common characteristics with the animals such as having sensations, instincts, desires and the like. Anatomical, physiological and biochemical similarities exist between them because they were made by one Creator. However, man is placed on the higher level because he can reason; he has a sense of beauty and a knowledge of God. He is a special creation far different from those in the Animal Kingdom because he was created in God's image.

### Care of the Environment

Ecology is an interesting area dealt with in biology



in which faith can effectively be integrated. Nowadays that there is a great awareness of the environment, lessons in biology can be planned as to produce changes in attitudes and values among students to make them respond to Nature's call for help. Such will encourage the students to take part in caring and properly managing the plant for their own sake and for the future generation. They will be made to understand that if wanton destruction and continuous depletion of the natural resources continue, the future will become too bleak for mankind and other inhabitants of the planet. However, in the midst of ecological catastrophe, all that is needed is trust in the Lord. God created the world and is continuously caring for it. He gave man all the good things in nature but he should use these according to His will.

Man was appointed by God as steward of His creation. He is, therefore, accountable to his Creator. He is answerable for the way in which he uses that dominion. He is expected to treat nature sparingly, sharingly, and caringly. (Wilkinson, 1980, p. 233) He is held responsible by God who gives him a set of general guidelines to follow in taking care of the environment. As Adam was given the freedom to name the animals in the garden, man was also given the "freedom to be co-creator with God. (Wilkinson, p. 234) Such freedom must not be abused or it will be forfeited.

### Care of the Human Body

Stewardship does not only include the care for the environment. It also involves proper care of the human body as well. The human body which is described as the "vessel of honor for God" (Spangler, 1992, p. 315) is bound by laws of respiration, circulation, digestion and other processes. accomplished by physical organs which are ascribed to God. Man's failures to submit to such laws can lead to illness and to loss of his life. Therefore, much attention to one's health through obeying what God has laid down can protect man's life. God is the ultimate source of life. He controls the beating of the heart, the movement of the muscles, the conduction of the nerve impulse. He keeps everything in order as long as man abides by His will and the laws he set for maintaining a healthy mind and body.

Emphasis given on the physiology of the human body and the benefits of good health would prevent the students from engaging in harmful practices that will destroy their body and their life.

### Bioethics

Biological issues such as genetic engineering, birth control, cloning, artificial insemination are major concerns

that must be attended to in biology classes. Is man playing "god" by controlling his own destiny and by creating another being? Is he interfering with God's plan for mankind? Intelligent and stimulating discussions on these areas will cultivate more reverence for the Creator.

In 1993 at George Washington University, two researchers, Hall and Stillman cloned human embryos. They produced 48 human clones which grew for not more than six days. They saw nothing unethical with their experiment and insisted that they did not create human life and had not destroyed it. However, their experiment created a great controversy and an ethical challenge. Ethicists called up nightmare visions of baby farming, of clones cannibalized for spare parts. (Dewitt, 1993, p. 41)

It is now easy for man to cut and splice genes through the process of genetic engineering. Human genes have been inserted into the DNA (deoxyribonucleic acid) of bacteria to produce insulin. Defective genes have been replaced by good ones. Such "tinkering with the genetic future of the human race" (Anderson, 1976, p. 35) seems to be against God's laws and disobedience to the law of nature. However, Christians should approach these issues of cloning and genetic engineering by "recognizing that the information encoded in living organisms is part of God's instruction to living things and that organisms obey these commands as their lawful response to the covenant between God and His creation". (Wright, p. 220) God gave man with "faculties trained by practice to distinguish between good and evil". (Heb.5:14) Today's technology must be used to accomplish good ends and to guard the integrity of creation.

### Strategies in Integrating Faith in Biology

God's truth is the foundation of true Christian education. It is the teacher's responsibility to search for opportunities to unite the course content and the eternal and infinite patterns of God's truth". (Gaebelien, 1968, p. 9) Such union is what integration of faith and learning is about.

The selection of appropriate strategies and methods is one way of integrating Bible doctrines and philosophy with the subject matter. There are several methods a teacher can employ in presenting his lessons. Among these are discussion, lecture, demonstration, experimentation, problem-solving and others. But which of these methods can develop Christlike attitudes among students?

Larson (Larson, 1992, pp. 31-35) suggested some approaches which might aid in the process which makes faith accessible to anyone. These methods can be useful in the

integration of faith in biology.

1. Voting consists of a series of statements or question to which participants respond by agreeing or disagreeing with each statement or question. It assists in establishing lifestyle choices which impact the growing faith and life of the youth.
2. Ranking exercise presents three or more possible choices for participants to rearrange in their order of preference or priority. This helps the participants to examine their thoughts, attitudes, feeling, beliefs, and behavior, as well as to explain and defend their choices.
3. Continuum presents two opposite choices or viewpoints and the respondents select the place in the continuum which most closely represent their views. This makes the participants more aware of the range of views that exist in the thinking of a seemingly homogeneous group of people.
4. Either/or is a forced choice between two options. Respondents select the option which they most closely identify.
5. Listening exercise consists of stimulus statement or paragraph to which each person in a group of three responds individually while others listen to him or her This provides an opportunity for each person to be listened to and to be a listener.
6. Dilemma is a story that presents a dilemma but stops short of a solution. This gives participants practice in generating alternative solutions and considering the possible consequences of each.
7. Interview consists of questions asked by the leader of a volunteer from the group. It gives the volunteer an opportunity to share some information with the total group about self, personal thoughts, feelings, attitudes and values. It allows the group to learn from the life of another in a short time.
8. Goal setting helps translate discussed ideas into planned action. It helps individuals to act on a decision. It is a way of getting things done. changing something, helping a person become more the person he or she wants to be.

These activities will help the students to reflect on their Christian conviction and to examine their faith values.

A thorough study of the syllabus to fit and insert faith values and Bible doctrines into the specified topics is one of the major steps to relate the subject matter to Christian beliefs and principles. Biological concepts built on the foundation of Christ recognizing Him as the Creator of life are the most important concepts. Students in all levels of learning must acquire these concepts to value their life and to live a more meaningful life.

"The person of the teacher and not the gimmicks and techniques counts" (Gaebelin, p. 83) A teacher can use a variety of techniques but if his personality does not reflect Christlikeness, it would be difficult for him to make his students believe the word of God and to lead them to Christ.

### Conclusion

Appropriate teaching methods and strategies, and teachers who are devoted to their role of developing scientific minds and Christian attitudes are essential in integrating faith and learning. Science and faith are inseparable. Faith in the Lord can be made stronger if science lessons are geared not only in developing skills, knowledge and scientific attitudes, but also in acquiring deeper appreciation of God's work.

A biology classroom is more than a laboratory area where students are trained to engage in the processes of science and to acquire the characteristic attitudes of a scientist. It is also a place where they will be led to understand that God is the answer to all the mysteries and puzzles about life and the world of living things. There is a limit to what man can do but there is no limit to God's power and grace.

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## APPENDICES

Appendix ASample Exercise Using the Basic Methods  
of Integrating Faith as Designed by Larson

## A. Voting

How many of you think that \_\_\_\_\_

1. we do not really appreciate and use the natural resources God created for us?
2. we must learn to live with nature rather than control nature?
3. concern for profit is the main cause of ecological crisis?

## B. Ranking

What program would the church become involved in that would have some impact on the ecological crisis? (Rank them according to what you think should be done first)

- \_\_\_\_\_ collect papers in neighborhood
- \_\_\_\_\_ work to get your city become more helpful in gathering used material
- \_\_\_\_\_ organize the elderly in your church to hand in old church paper
- \_\_\_\_\_ educate the children not to use plastic

## C. Continuum

Choose the place on the continuum, between 2 opposite extremes which most closely represent your personal viewpoint.

Man's selfish nature is responsible for ecological crisis.

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Strongly Disagree

Strongly Agree



Appendix B

## Sample Syllabus for Integrating Faith

## Topic: Ecosystem

General Objectives: At the end of the unit, eighty percent of the students are expected to:

1. explain the relationship of living things to their environment
2. help maintain a balanced ecology in accord with the rhythm and harmony of nature.
3. feel grateful for the lavish gift of God.

Specific Objectives	Faith Values	Skills	Suggested Activities
1. Define environment, ecology, biosphere, ecosystem	Good things we enjoy in nature are gifts from His loving hand and are to be used according to His will.	Defining terms	Discussion Field trip
2. Differentiate between habitat and niche.		Differentiating	