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INFORMATION TECHNOLOGY: MANAGERIAL ASPECTS OF THE INTEGRATION OF FAITH AND LEARNING

by

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Introduction

The role of technology is vital in education and essential to a constructivist model of teaching. Certainly, computer technology has become a fundamental part of education across the curriculum and will likely be more so in the future. Instead of simply being a source of information, computers are becoming multimedia workstations for students. Innovative use of technology combines telecommunications (e-mail, video-conferencing, online resources, Internet navigators), multimedia authoring (home page editors), user-friendly and convenient applications software. These turn students into producers as well as consumers of content. The role of the classroom teacher is evolving from that of a giver of information to that of a facilitator of student learning. New technologies already exist to help teachers enhance that evolution.

The aim of this paper is to reveal the perspective and awareness levels of preservice teachers and students about specific technologies, the role of technology in education, and the preparation for integrating technology into their professional and Christian lives.

However, the way to bring about this aim, is to keep within the law of Hippocrates, «don't harm». The use of computer technologies should not harm either the spiritual or physical being of man. "So if anyone destroys God's temple, God will destroy him. For God's temple is holy, and you yourselves are his temple" (**1 Cor.3:17**). Unfortunately, today there is a real tendency to break the balance between coexistence of technology and man.

Consequences of information revolutions for a civilization

In the history of the development of civilization there were some information revolutions-transformations of public relations because of cardinal changes in the area of processing of the information available. A consequence of similar transformations was the purchase by a human society of new quality.

The first revolution relates to the development of writing skills. These skills led to a gigantic jump in both quality and quantity results. The second revolution (middle of XVI century) radically changed the whole being of organization by book-printing. The third one (the end of XIX century) is significant by its discovery of electricity and the creation of new devices of

operative transfer of information including the radio, telephone, and telegraph.

The fourth revolution (70s of XX century) relates to the invention of the microprocessor technology and the appearance of personal computers. This included computers and supercomputers: conductors and superconductors, microchips, World Wide Web (www), Cybernetics and others that do not surprise us any more. We live in a world of information technology.

The greatest opening of our century is «Artificial Intelligence» which brought a lot of positive factors into our life. Possibilities of the world wide web has opened up new horizons of knowledge and boundless resources of practically unlimited information.

We can name the following set positive:

Manipulation of extensive information is a global resource
Dialogue with the people at a great distance
Distance education
Automatic data processing
Acquaintance to cultures of different peoples, etc.

Who is using this modern science and advance technology? For whom is it used? To what purpose? From this point of view such discoveries and inventions pose a real challenge to our faith affirmations in terms of morality and ethics of our common, collective life. Does this advanced technology enhance the common human happiness and welfare of all?

There is also a negative set. Because of the sinfulness of our world there are many negative events:

Dependence on the computer practically in all spheres of human activity;
Distribution of the "dirty" (pornography, lewd and violence graphics, false propaganda etc.) information through the Internet;
Virus attack;
Intellectual piracy;
Influence on the subconsciousness through subliminal tactics in program production;
"Black" games aggressive, brutal in which people are killed in virtual reality.

There is a dependence on the computer in practically all spheres of human activity. Now millions of people "dive" into boundless open spaces of the

Internet, the huge cybernetic space occupied by the numerous inhabitants, sometimes very rough, lacking moral restraint. The Internet speaks to general virtual reality in the world.

However, now there are many problems which force us to analyze attentively the course of events in this global network. For example, there is some virtual place entitled Multi User Dimension [MUD]. Various users can be connected to this game. Each of them operates with the computer person. Therefore it is actually life in virtual space. You can be at different levels in MUD. When questioned if the level is the level which they name as God, they say, "No comments!" The inattentive and disorderly application of multimedia technologies can lead the person to narcotic dependence and then to spiritual dependence.

We can say that harmony inside the system "man – engineering" is broken. The integration of new information systems in all spheres of human life results in serious illnesses of thinking and behaviour of people. The main issue is: "What is there do be done about it?" We turn to the Bible for assistance.

A Biblical Approach

There is a whole group of books of literature in the Old Testament known as WISDOM literature. In the book of Proverbs, it states:

> It is the Lord who gives wisdom; from him come knowledge and understanding... If you listen to me, you will know what is right, just, and fair. You will know what you should do. You will become wise, and your knowledge will give you pleasure. Your insight and understanding will protect you. . . **(Proverbs 2:6 and 9:10)**

Thus on the one hand, there is an emphasis on seeking, searching for wisdom, but on the other hand there is an essential need to situate it within the larger, transcendent frame of reference. The divine dimension must constantly determine human wisdom. Surely, that is recognition of our limitations as well as our inclination to pride and selfishness. Consequently, in another section this point of view is reiterated by saying:

> Choose my instruction instead of silver and knowledge rather than the finest gold. I am wisdom, I am better than jewels; nothing you want can compare with me . . . Buy truth, and do not sell it; buy wisdom, instruction, and understanding.**(Proverbs 8:10-11; 23: 23)**

Another aspect of this ancient wisdom is that it does not result in verbalism or verbosity. Much of so called knowledge remains meaningless and irrelevant. It is possible to multiply words without knowing what one is stating. Therefore, knowledge must have a goal, a purpose and direction. It is not mechanical. From this point of view it must be an instrument. **Knowledge must lead to understanding--understanding of the divine and human reality.** In the Bible, knowledge is always conceived in terms of understanding. The two are organically related. The two together constitute wisdom.

Obviously, knowledge and understanding, according to the Old Testament, ought to be for moral-ethical attitudes and actions. It must make one sensitive to the finer, higher qualities of life and living, the ability to distinguish between what is really good, just and right and what is bad or evil and not relevant for the vast majority of people. Knowledge and understanding should not isolate or emasculate but engage in justice oriented actions.

Human selfishness or arrogance very often distorts knowledge and even understanding, blurring the necessary, significant distinctions. Thus it is evidently clear that human sinfulness and selfishness can be a serious impediment to authentic knowledge and understanding. Consequently, according to the Bible, there is a need for a radical change of mind. Then knowledge and understanding can become transformative and genuinely communicative. The Bible as a whole is ample testimony to such knowledge. Words, alphabets and even sounds constitute bits of knowledge and hence of understanding. We also can say that computers were created for the best understanding of our world. Therefore, it is vitally necessary to examine and evaluate critically the nature and content of knowledge imparted to us. One of the reasons is that very often we have mixed divine wisdom with human wisdom or have tried to rationalize limited wisdom in the name of God.
Jesus confronted the people in this regard. He said, "Why do you not understand what I say? It is because you cannot bear to listen to my message." (John 8:43) Jesus had expressed this idea powerfully in the following words, which he had inherited from the old prophetic tradition of the Jewish people. He had uttered:

> This people will listen and listen, but not understand; they will look and look, but not see; because their minds are dull, and they have stopped up their ears and have closed their eyes. **(Mathew 13:l4-l5a; Mark 4:10-13 and also Psalms 135:15-18)**

This means that much depends on subject-object relationship. So-called objective knowledge has to be received critically and carefully by the subject concerned. On the subjective side there are fundamental problems of human tendencies--one is liable to selfishness and stubbornness, arrogance and greed. From this point of view, knowledge itself can be reactionary as it can be manipulated or engineered by people with vested interests or it can go along in a non-progressive attitude. Human beings are endowed with the physical faculties of eyes, ears and brain and yet cannot comprehend the full nature and scope of knowledge. Human prejudices and presuppositions can thwart the full flourishing of knowledge and understanding. Therefore it must have physical-spiritual dimension. Real wisdom and knowledge must lead to freedom and liberation.

For us it is important to bring all these principles to the process of teaching Computer Science in our college. For the analysis of a situation it is necessary to consider potentialities of formation of information culture of the man on a bible basis.

The definition of information culture and educational process

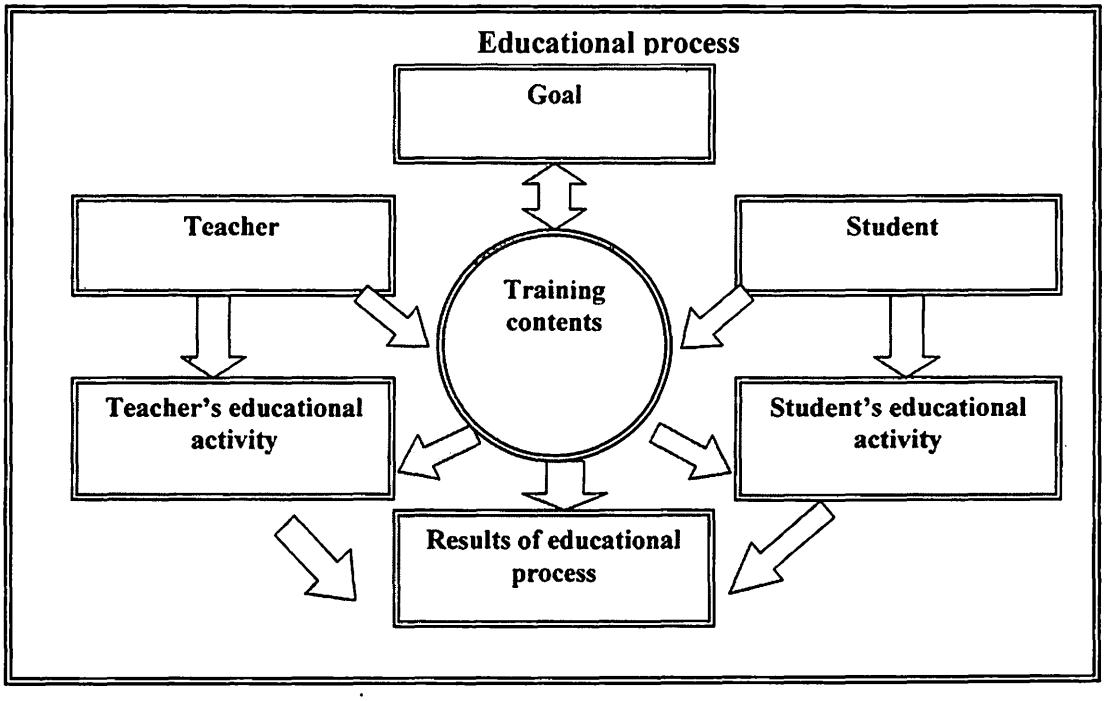
The process of formation of personal information culture is the basic task of the Computer Science discipline. The following is the definition of information culture: Information culture is the skill to work purposefully with the information, using the information for reception, processing and transferring of computer information technology by modern means and methods.

We tried to look at this question at the point of educational management while taking the class "Computer Science." In our research we left the characteristic of educational process as a dynamic system, in which there is constant interaction of subjective factors in the educational process, namely: the teacher, as a managing component and the student, as a controlled component. The program of their activity is determined by: a) the purpose of education; б) the tasks, which are investigated by various educational subjects; c) the volume of training and the achieved level of intellectual and general development of the students.

In the educational process the set of factors that work are due to the following: the purpose of training, the contents, the principles, the methods, the form, the means, the organization, the material base of training, the

teacher, the students, etc. The set of factors of the educational process can be categorized into two groups:
1. Objective factors - purpose, contents, principles, methods, form, means, organization, material base of teaching;
2. Subjective factors - teacher and student.

Figure 1. Objective factors and Subjective factors in the Educational Process

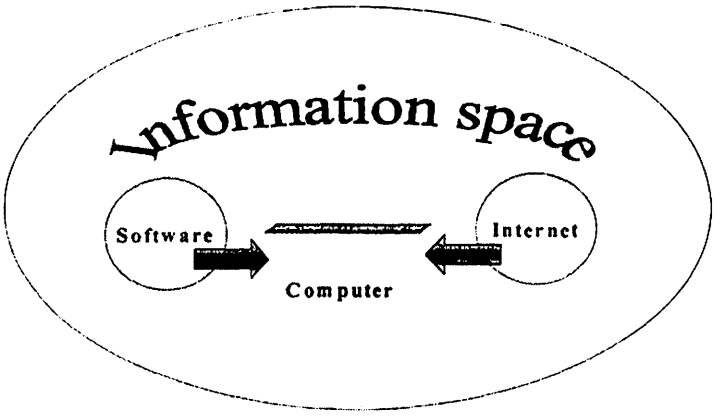


As shown in the Figure 1, the interaction of system elements occurs through a central component which is the content used for training. The contents of the educational process will depend upon the trend of the training process and its results. With the arrival of the computer in the classroom there are essential changes in the educational process.

The arrival of the computer in the classroom

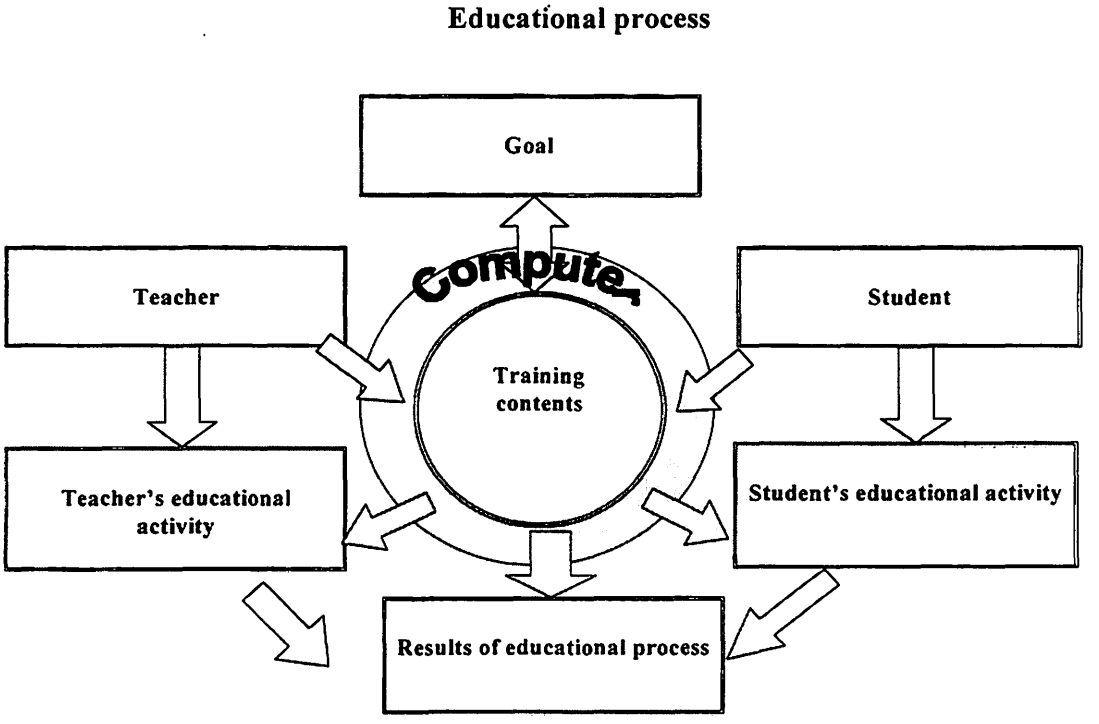
The computer plays a unique role in its functions of the educational process. Computers activate the study process, make the study more personal, heighten the use of visual methods, help to shift from theoretical knowledge to more practical, and elevate the interest of the love of studies. However it would be wrong to look at the study of the computer separately from its other vital components, since the computer is the quasi-subject. The next figure will help to understand the definition.

Figure 2. Computer as a quasi-subject.



We can see that the computer unites the ideas of many people (the developers of software, the authors of scientific works, articles, etc). Thus, the form of management of the educational process varies. There are many basic functions of management, however, management is under construction in view of the presence of artificial intelligence. Now, it is necessary to consider the presence of a third subject - the construction of a correct model of management of the educational process by using the computer.

Figure 3. Computer Integration at the Educational Process



This circuit demonstrates that the use of the computer in the educational process governs the communication of all system components. To the system of "student-teacher" the computer is added as a quasi-subject.

To understand the algorithm of the integration of faith and learning while studying Computer Science it is necessary to count the changed relationships between components of the study process. The computerization of different spheres of human activity has shown that the application of computers gives repeated increase of efficiency. Education has not received cardinal positive changes from the introduction of programs in educational institutions at the rate that computer science has. To a great extent this problem is connected to lack in management of educational processes.

Thus, the question of defining the vital functions of management is very important in the study process. And these functions are:

- The organizational function of the educational process (EP)
- Planning
- Registration
- The Analytical function
- Supervising
- Stimulating or motivation function and
- The function of acceptance of the decisions.

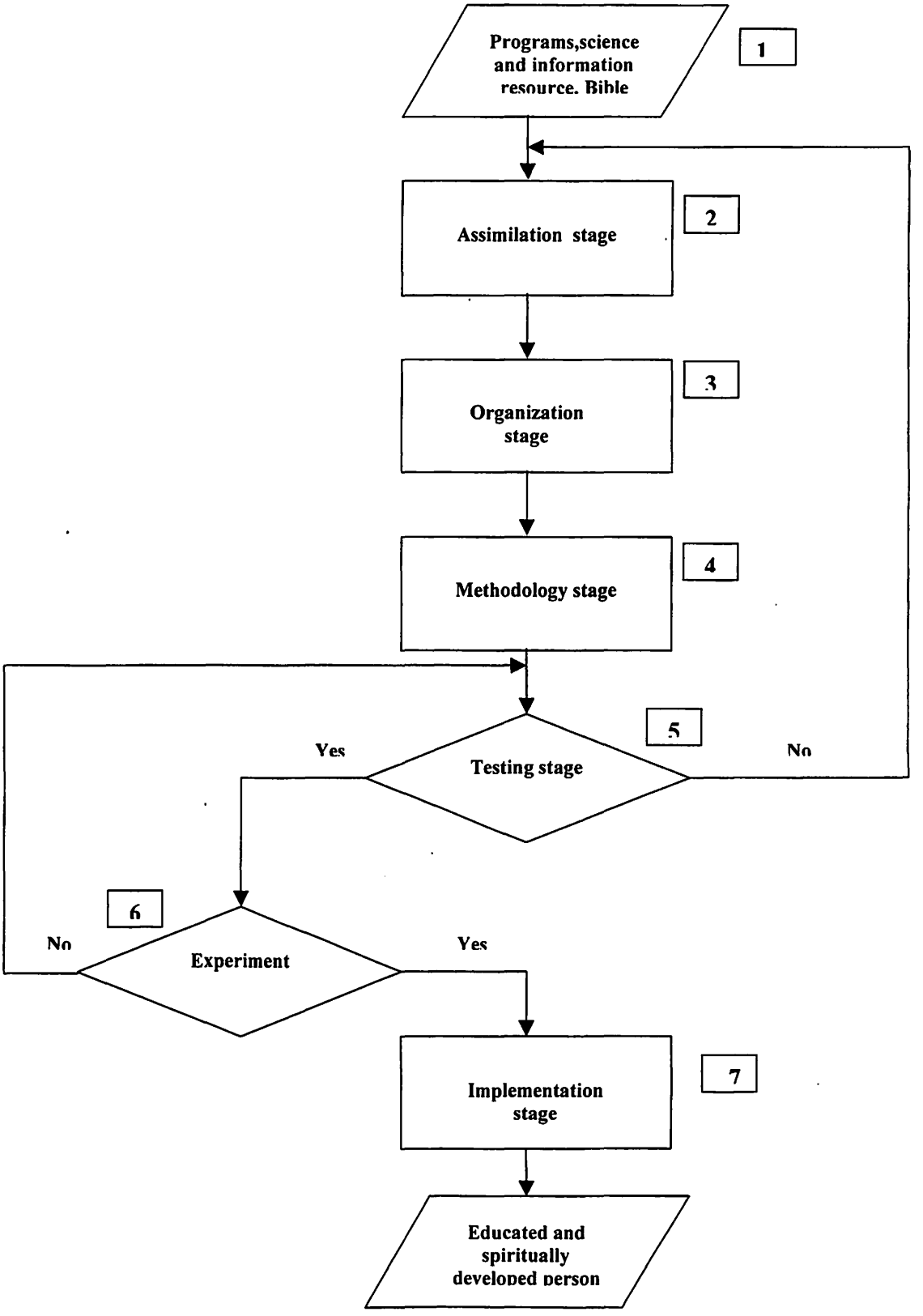
For effective management of the educational process, the coordination of all elements in the system and the precise definition of administrative functions is necessary. With this process of development the improvement of the contents, methods and organizational forms of training should be put in conformity.

As an experiment, an algorithm of management was developed to the process of the integration of faith and learning while studying the Computer Science class.

When developing the algorithm we were coming from:

1. Presence of:
    a. the both educational and spiritual resources and
    b. the software.
2. The teacher having knowledge of:
    a. this data and
    b. methodical skills.

Figure 4. The Algorithm of the Integration of Faith and Learning



The algorithm consists of eight steps. Each step has the certain functions. Explanation to the algorithm:

1. Find sources of the needful information.
2. Choose from the different spheres of information needful data.
3. Organize resources into a reasonable order with a possibility of finding relations between parts.
4. Make a decision as to the choice of methods in working with the chosen sources.
5. Analyze the experimental program.
6. Explain the experimental technique and introduce clarity into the data. If the result is negative go back to step #2.
7. Conduct the actual experiment with a chosen student group and their selection of the study material. Analyze the results. If needed return to the testing stage.
8. And finally, incorporate the developed program into the study process.

The Analysis of the Program and the opportunity to integrate faith in the training

Therefore, to integrate faith and learning, we have addressed the construction of module programs, which are more flexible and accustom students to creative activity. And then we tried our algorithm on one of the modules in the Computer Science program. The program constructed by the module principle gave us an opportunity not only to make the educational process more effective, but also to analyze the issue of the presence of Christ during training.

The program of computer science consists of seven modules:

1. Theoretical bases of computer science or the technical base
2. Systems software
3. Applied software
4. Databases
5. Programming
6. Computer systems
7. Bases of ecological use of the computer and computer ethics.

Each of these modules gives us an opportunity to integrate faith in the training. However, the seventh module is completely constructed on a parallel function, addressing questions of modern computer technologies and Bible research. We have arrived at two results while working with the developed

algorithm. The first one is the practical result and the second is the chance to analyze the effect of it. We can only have success if faith will be integrated in each element of the educational system and the management's stage of the educational process, as well as making available to students this necessary information.

For the analysis stage we have developed the College Questionnaire for our students. In our situation, 186 students were asked to respond to the questions. In the College Questionnaire we have weighed and designed such questions as:

1. Is it necessary for the modern expert to consider studying computer science?
2. Should the believing Christian understand modern information technologies?
3. Can computer technologies be used in the evangelistic sermon? If so, how?
4. In your opinion, are there possible ways of enhancing evangelistic sermons through the teaching of information technologies in College? If so, what ways?
5. In your opinion, is there a danger of substituting the real world for the virtual?
6. In the system « the teacher – the computer –the student » is there a place for God?
7. Do you see any danger to the spiritual world of man in the use of computer technologies? If so, what?
8. Are you concerned about the dependence of society on the computer and computer dependence of the person?

We have the following results:

Figure 5. Percentage ratio of the positive answers on questions of the questionnaire

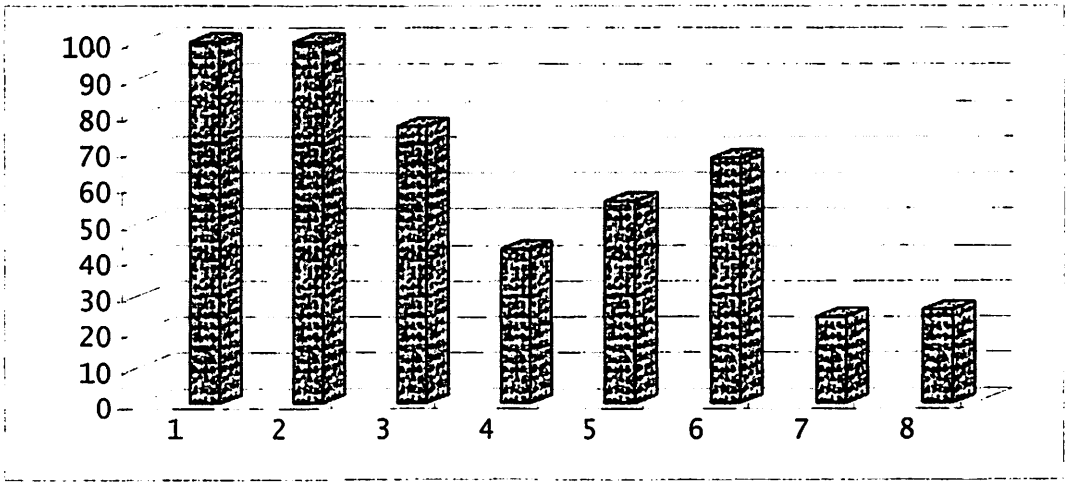
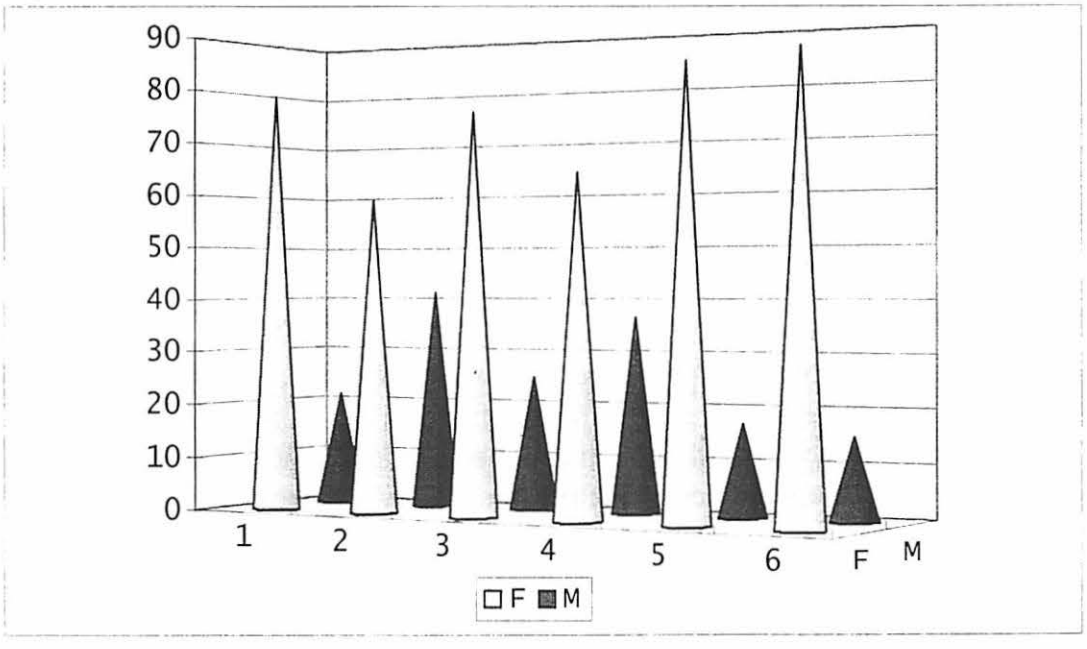


Figure 5, shows an approximate result of positive answers in our questionnaire. All the students concluded that it is a must for a specialist to at least have some basics of computer knowledge. However , only 43% see an opportunity to preach the Good News through the study of the subject. It was a delight for us that 68% gave a positive answer on the question «In the system « the teacher – the computer – the student » is there a place for God?». What we think is dangerous is that our students don't really understand the importance of studying issues of the mass media technology influence on the mind of a man. Only 25% can see danger to the spiritual world of man in the use of computer technologies and are concerned about the dependence of society on the computer and computer dependence of the person. According to our algorithm we should repeat the process from the assimilation stage.
There was also an analysis of other aspects of an issue like, the difference in views on asked questions:

- guys and girls;
- believers and non-believers.

The difference of views of guys and girls was very essential on actual problems.

Figure 6. Percentage ratio of the answers on questions of guys and girls.



From Figure 6, we can see that girls are more particular to questions relating to the influence of mass media on the mind of human man. That leads us to a conclusion that they are more careful in choosing software and even working on the Internet.

Some interesting answers students gave to questions of the questionnaire were:

In your opinion, is there a danger of substituting of the real world for the virtual?

"Yes. In a fairy tale all seems beautiful. The man is very disappointed, when he returns to the real world"(F, 1982 y. of birth).

"If computer is used with intellect that danger is small"(F, 1984 y. of b.).

"No! We can understand the world better through virtual reality"(M, 1983 y. of. b.).

In the system « the teacher – the computer –the student » is there a place for God?

"The student sees God not through the computer but through the Christian character of the teacher"(F, 1980 y. of b.).

"The virtual dialogue creates only superficial contact. However, nobody marries virtually. I never met a man who would accept Christ only through a Christian site"(M, 1981 y. of. b.).

Do you see any danger to the spiritual world to man in the use of computer technologies? If so, what?

"For many people computer engineering becomes an idol"(M, 1981 y. of. b.).

"The computer games take all my free time. I cannot even speak about spiritual growth. (M, 1984 y. of b.).

"With the computer, man becomes lazy, and laziness is the first step of deviation from the God"(M, 1983 y. of b.).

While comparing views of believers and those of non-believers, the difference was also shown in approaches and analyses of any situation. The difference is seen especially in questions through study of the material on evangelism and questions concerned with the dependence of society on the computer and computer dependence of the person. Below are some answers on these topics:

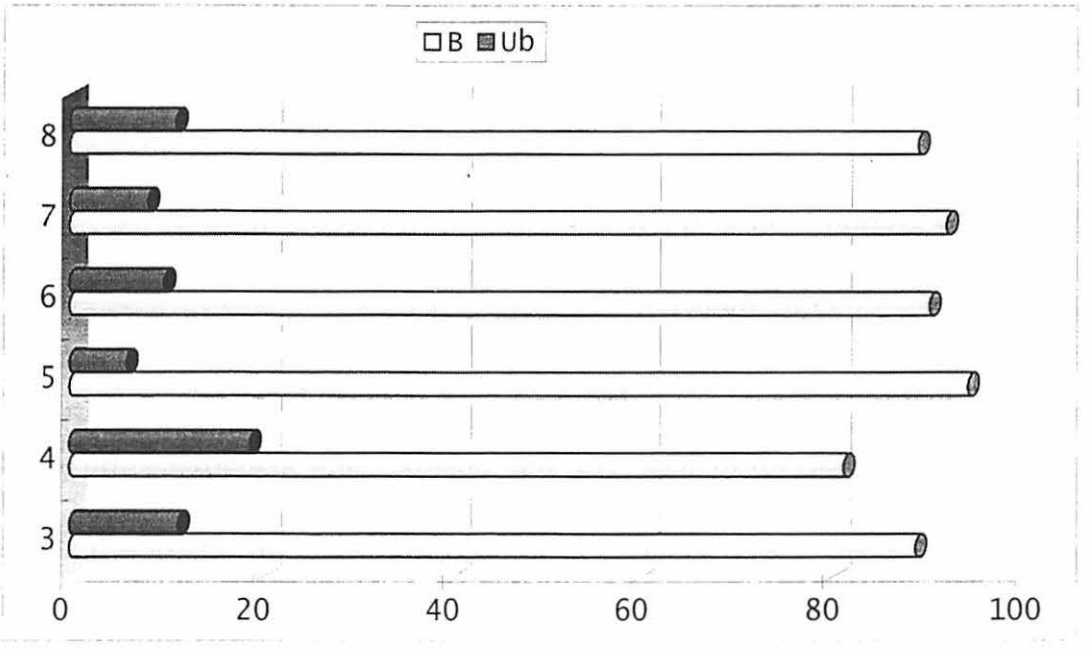
Are you concerned about the dependence of society on the computer and computer dependence of the person?

"We can see computer dependence of a society in all vital activity spheres. But computer dependence of the person is very dangerous. This kind of dependence is stronger than drugs and alcohol."(B., 1982 y/b).

"In my opinion, the computer can always be switched off"(Ub., 1983 y/b).

"Computer dependence is a serious illness. The help of an expert is necessary for its treatment"(B., 1982 y/b).

Figure 5. **Comparison of the answers on questions of the believers and unbelievers.**



The experiment and the analysis of its results will allow us to re-evaluate the methods of choosing study materials, to ascertain data and finalize the program of Computer Science.

Conclusion

In the development of information technologies it is possible to determine the following tendencies:

- Amplification and control by information technologies
- More flexible and universal management of information resources
- Development of electronic commerce and business
- Transition in all spheres of human activity to a virtual reality.

Hence, our students should be able to work with information technologies and - be ready to use IT [Information Technology] in the spiritual sphere. We are testing our program in our College and have some results. We have paid attention to all stages of the educational process.

In this model the integration of faith and learning has six steps. They are:

1. Organizational function (teaching, educational programs, subprograms, cultivating working).
2. Planning (theme of lessons, text from Bible, thesis, task, etc.)
3. Development in both the use of ready forms and the methods of taking into account the parameters.
4. Analysis of results and brainstorming.
5. Supervising (student evaluation)
6. Development and application of different methods of stimulation (incentive).

The first result of the analyses on the work of the suggested algorithm of the integration of faith and learning has shown the need :

a) to select study material acknowledging the presence of the non-believer category of students
b) to be aware of the differences of opposite sexes in opinions on the different problems in making the public computer-friendly
c) to analyze the arguments of the necessity of studying the Bible today
d) to bring awareness of the positive and negative influences of the computer on the life of a person, and
e) to study legal and ethical rules of behavior in information space.

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