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Multimedia Technology and Training Programs in Lebanon.

A research topic
presented to the Business School
Beirut University College.

In partial fulfillment
of the requirements for the degree of
Master of Science in
Business Management

By
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August, 1994.

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Approval of Research Topic

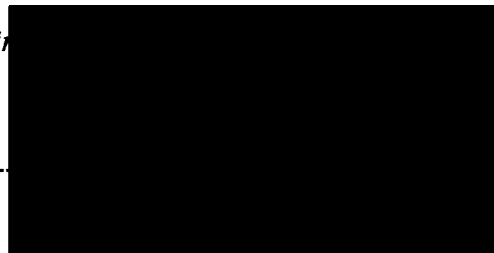
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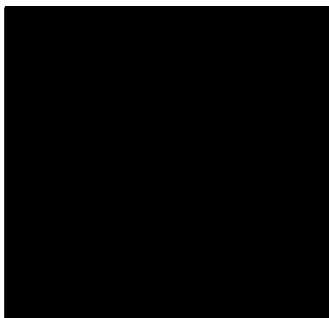


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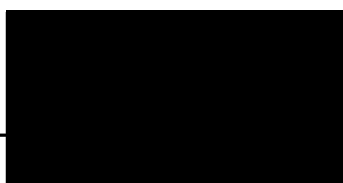
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To a caring father & a tender mother

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ABSTRACT

In a country like Lebanon, that lacks most natural resources (oil, metals, gold, etc), the only wealth left is its human resources. The Lebanese people were always proud of their ability to use their skills to bring wealth to their country. Using sectors like banking and tourism, Lebanon acquired a central role in the region during the sixties and seventies.

Today, Lebanon is facing major challenges. Being largely destructed during the civil war, Lebanon lost many of its characteristics, and other countries took its role as the trade intermediary in the region. Moreover, the claimed peace between the Arab countries and Isreal is supposed to end the military war and trigger an economic one. As most of the politicians say, Lebanon is expected to be the country that will suffer most from this peace as its is still in the reconstruction phase and haven't recovered completely yet.

Given all this, the Leabnese people have one alternative. They should build on their only asset, their human resources, to get the best of it. Proper training should be delivered to all workers and employees to increase their skills and introduce them to modern work methods and techniques. Multimedia based training is one form of training that is acquiring increasing importance in America and Europe, and leading to very rewarding results. In this research multimedia based training is discussed reflecting its characteristics. The research also explores the potentials of using multimedia in the training programs in Lebanon.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION.	1
A. Objective of the research.	2
B. Research methodology.	2
II. TRAINING & MULTIMEDIA TECH.	4
A. Training Practices.	4
1. Importance of Human Resources.	4
2. Importance of Training Programs.	5
3. Training Programs.	7
<i>i. The Developing Stage.</i>	8
<i>ii. The Delivering Stage.</i>	11
4. Traditional Training Program.	13
<i>i. Lecture / Conference.</i>	14
<i>ii. Labwork.</i>	14
<i>iii. Manual Skills Training.</i>	15
<i>iv. On-the-job Training.</i>	15
B. Multimedia.	16
1. What is Multimedia ?	17
2. Components of a Multimedia System.	19
3. Production of a Multimedia Application.	21
4. Application Areas of Multimedia.	23
C. Multimedia in Training Programs.	24
1. Automating The Training Program.	24
2. Multimedia in Training Programs.	27
3. Multimedia at Union Pacific.	28
4. Bottom Line Results.	31

III. RESEARCH METHODOLOGY.	38
A. Research purpose.	38
B. Sources of Information.	39
C. Survey Design.	39
D. Data Analysis.	41
IV. RESEARCH ANALYSIS AND RESULTS.	43
A. Characteristics of Tr. Prog. Using MM.	43
1. Direct Feedback	43
2. Interactivity.	44
3. Tutorial Teaching.	45
4. Simulation & Real Life Scenarios.	46
5. Experimenting on Computers.	47
6. Time Effectiveness.	47
7. Cost Effectiveness.	48
B. Training and multimedia in Lebanon.	52
1. Questionnaires Analysis.	52
<i>i. Training.</i>	52
<i>ii. Multimedia.</i>	58
<i>iii. Multimedia in Training.</i>	60
2. Interview.	60
IV. CONCLUSION.	63
A. Research Limitation.	63
B. Research Findings.	64
C. Recomendations for Future Research.	66
D. Concluding Remark.	67

APPENDICES	69
1. QUESTIONNAIRE FORMAT ONE.	70
2. QUESTIONNAIRE FORMAT TWO.	74
3. MULTIMEDIA SET OFFER.	76
BIBLIOGRAPHY	77

CHAPTER ONE.

INTRODUCTION

The twentieth century has been known as the century of technology. Many discoveries and inventions took place that the life of the human race underwent a great leap, one that was never experienced before. Nobody at the beginning of this century could have expected that after eighty or ninety years such vast change would occur in almost every aspect of human's life. With the discovery of the electrical power, the invention of radios, telephones, televisions, computers, and so many other inventions, technology entered into minute details of every day's life and shaped human destiny..

As technology affected the life of people in general, and business actions such as buying, selling, trading, profit calculation, etc. Calculators, cash registers, etc., and lately computers with all its derivatives and peripheria (such as modems, electronic mail systems, bar code readers, automatic teller machines, etc.) left an obvious impact on the business transactions in terms of accuracy, efficiency and speed. The advanced technologies in other fields, such as communication and transportation sectors, also help in facilitating the business

transactions all over the world. Thus, business operations in the twentieth century, became largely dependent on technological inventions and breakthroughs.

Objective of The Research.

The purpose of this research study is to assess the implications of multimedia on training practices in Lebanon.

Research Methodology.

In this study, I will talk about training programs, multimedia, and the use of multimedia in training programs. Next, I will use questionnaires and interviews to get information about training and multimedia in Lebanon and then forecast the potentials of multimedia use in training.

The research is composed of five chapters. Chapter Two starts by showing the importance of training as a managerial function and discussing the various training practices. Then, multimedia is defined and the various components of the multimedia system are analyzed. An idea is given about the production of multimedia and the different application areas are showed. After that, multimedia based training programs are discussed with reference to a real experience thru a case study.

Chapter Three identifies the research methods used, specifying sampling procedure and analysis tools.

In chapter Four the characteristics of multimedia based training are discussed. The data about training and multimedia in Lebanon that was gathered from the questionnaires and interviews will be stated and analyzed..

The last chapter concludes the work of this study and determines the final results.

CHAPTER TWO

TRAINING & MULTIMEDIA TECHNOLOGY

A-Training Practices.

1. Importance of Human Resources.

Human resources have become the key asset of the knowledge corporation. Thus, a substantial portion of the company's resources being money, time or efforts, will be invested to harness the employees' motivation and skills, so that, individually, they can make contributions that will enhance the competitiveness and profitability of the company as a whole (1).

The investment in human resources takes many forms. Knowledge companies seek to hire the most talented and best educated candidates for every position within the company. This is in contrast to what used to happen in the past, where the companies were after the least paid employees in order to minimize the wages costs. Nowadays, the company knows that if it fails to attract the best qualified employee, it is expected that its rivals will not. Thus, it offers its employees the best package possible. Today's job candidates require more than a pay check

at the end of each month. They ultimately care for economical benefits, but they need more. They want a feeling of safety on the long run, a possibility to advance, and an opportunity of self realization. The various theories about human motivation discussed these factors and gave various approaches to achieve the above mentioned benefits.

2. Importance of Training Programs.

Training is one of the tasks that are required by management of the firm . Although frequently training is considered as part of the staffing function, yet it has a great importance that it can be considered a function by itself. Figure 1 shows the various managerial functions and tasks. Training can have a positive (or a negative) effect on the employees' motivation and performance, and this in turn is reflected on the performance of the company. Training is developing people as individuals and helping them to become more confident and competent in their lives and in their jobs (2). Training is rapidly a growing field and has become a major necessity for the profession. The need for training always existed, but today the need is so much greater for many reasons. First, "the pace of few

MANAGERIAL FUNCTIONS AND TASKS

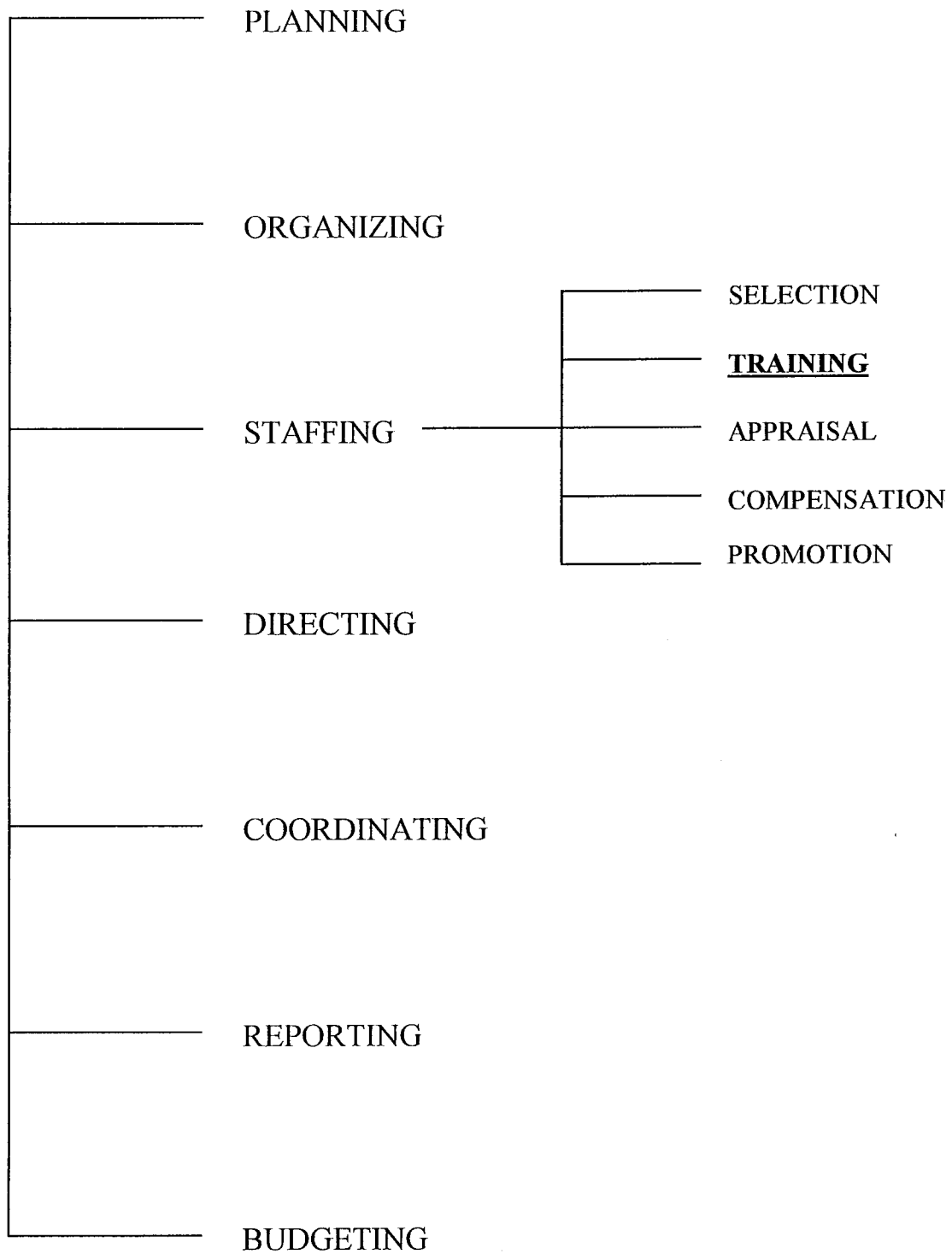


Figure 1

increasingly gathering momentum" (3). What was appropriate years ago is no longer appropriate today. In the past centuries the social experience of any culture extended over several generations, not the case nowadays. People in general, and employees in specific, should always be allowed and helped to go along the fast changing environment, and training is the tool. Second, training is gaining more managerial support. Earlier, training was viewed from the short term perspective translating only in additional costs. Now, managers are experiencing the benefits and positive returns of training as reflected from better and enhanced productivity. This is related to the previously mentioned correlation between training from one side, and individual as well as corporate efficiency on the other side. Third, training is gaining growing acceptance from individuals and employees. People started to believe that learning is a lifelong process (4). In all stages of life, man can learn, develop and improve. Finally, training is one of the methods by which a person learns and develops.

3. Training Programs.

Because of their great importance, training programs must be carefully set. There are specific steps that the personnel

department in any organization should follow to have an efficient training program of its own. The organization might find it necessary to seek the help of training professionals in establishing the training programs. Establishing training programs can be divided into two stages, the development stage and the application (or delivering) stage. Each stage has its own characteristics. Figure 2 provides an idea about the various aspects of a training program.

i- The Development Stage.

The development of an effective training program is one of the most critical tasks. If this program was developed inappropriately, it will lack any positive effect on the trainees. Thus this stage should be wisely and carefully dealt with.

The development stage consists of six steps. Although some other researchers and HRD professionals have divided this stage differently, yet the essence is the same but in a different form.

The **first** step in the development stage (DS) is defining the purposes of the training program. In other words, what does the personnel department hope to achieve from the

PHASES OF TRAINING PROGRAMS

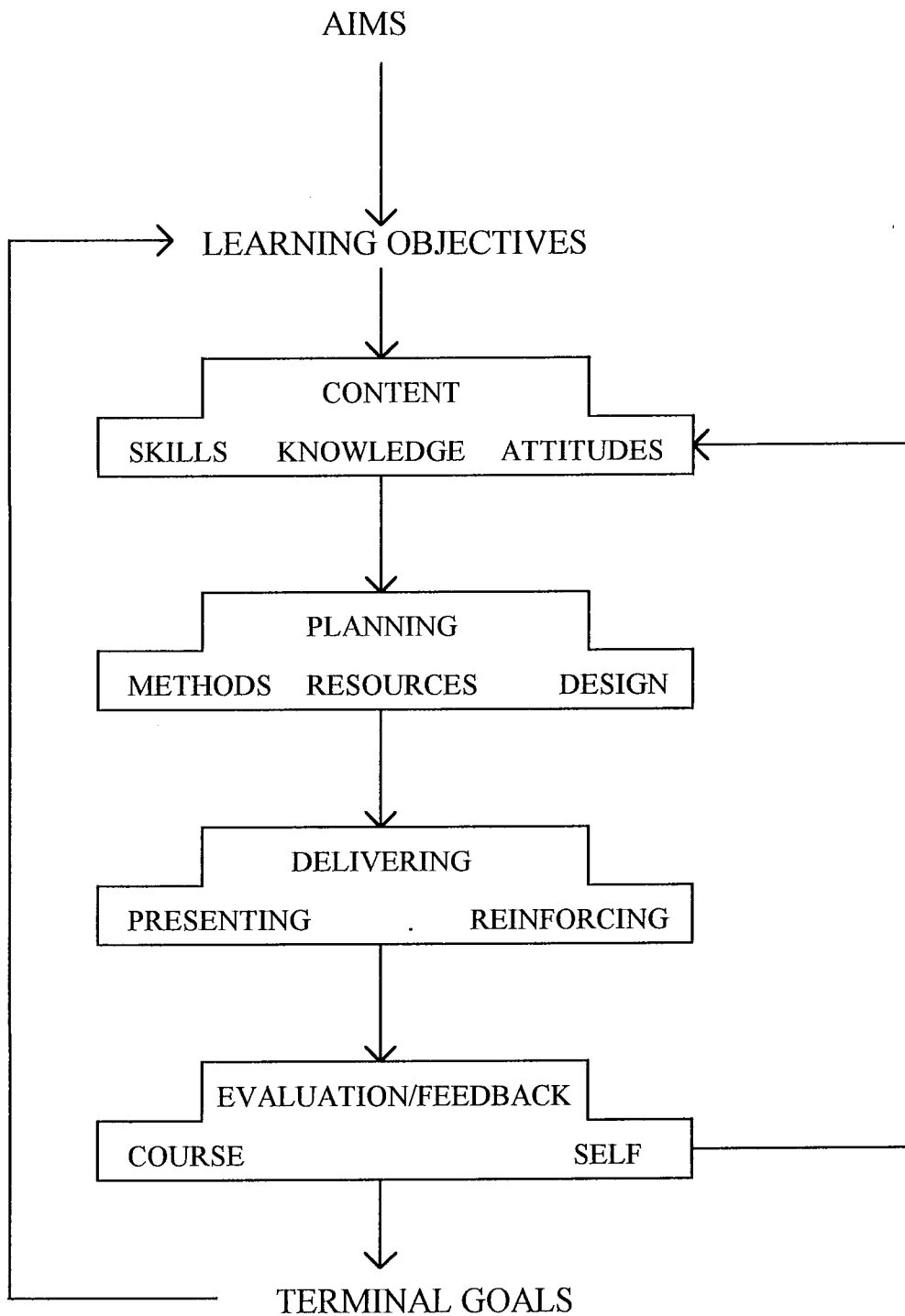


Figure 2

SOURCE : DEVELOPING EFFECTIVE TRAINING SKILLS.

program. The purpose differs from an objective, in this context, in that it is concerned with the long term goals on the side of the organization.

The **second** step is defining the learning objectives. After the broad purposes have been set, clear learning objectives are to be determined, such as what will the trainees be able to do or know at the end of the program.

The **third** step in the DS is determining the content of the training program. The content of the training program is tied to the learning objectives. The learning needs are of three types, knowledge, skills and attitudes. Thus the contents of the training program should meet with the needs of the trainees.

The **fourth** step is determining the different resources available in the organization. The resources can be divided into physical resources, such as rooms, instruments and tools, audio visual aids, etc., and human resources such as teachers, trainers, etc.

The **fifth** step is to choose a training method. The choice of the method is related to three factors :

- the students preferences, abilities, and personality
- the trainers, preferences, and ability
- the resources available in the organization.

The **sixth** step is designing the training course. This means summing up all the previous steps and building the

training course section by section. A lesson plan should be put indicating the learning goals, learning material, learning methods and the timetable regulating the details of the course.

With these six steps the training program is ready to be delivered. If enough attention have been given to the development stage, the following work will be easier and more comprehensive. If during the application of the program some weaknesses appear, it is wise to revise the development stage to make sure that all steps were properly followed.

ii- The delivering Stage.

In this stage, the trainer must make sure that the training session will take place smoothly. First, he should be well prepared and ready for the session. It is always necessary that he prepares a "trainer checklist". The list contains all the major and minor tasks or items that the training session will cover. This list will not only facilitate the trainer's task on his first meeting with the trainees, but will also help him on subsequent occasions, and perhaps will help future training development. The trainer being ready now, he should handle the learning facilities. He can use a classroom, a lab, an outdoor environment, etc. The place where the trainees will sit (room

layout), and the place the trainer will sit (trainer's layout) should be considered by the trainer as well as his/her "tool kit box" consisting of stationary, personal notes, charts, transparencies, etc.

On the first meeting, the trainer should establish the rules that will guide the path of the training program. He must arrange the timing of the meetings, the breaks and the communication channels with the participants. In other words, he trainer should establish the mood of the training session.

Presenting the material of the training program is directly related to the type of the training method or practice, and will be tackled when the training practices are discussed. However, it is important to talk about the evaluation of the trainees at the end of the training course. If the course offered knowledge information, a written or an oral test can be used ; if the course offered skills, a performance test can be done. The results of these tests are used by the trainer to reinforce any part of the training material that needs reinforcement.

Once the training program is over, evaluation of the course, as well as the trainer, is needed. The personnel department should know to what extent the course was successful in enabling the trainees to achieve the learning objectives, and how successful was the trainer in the choice of

the methods of training. Any modification that is deemed necessary should be effected in order to insure the utmost benefit of the training program (5).

4. Traditional Training Programs.

Training can occur in so many different ways and procedures. In fact, any act that is taken by any level of management to develop the standing of its employees, and that involves adding any piece of information, is a training practice. However, training practices can be divided into four groups according to the nature of the content of the training program. These four groups are : **Lectures, laboratory work, mechanical training, and on-the-job training.**

It must be understood that there is no perfect way of training. Each way has its drawbacks. There are many considerations that present themselves. There are questions of money, time, effectiveness, instructors, and so forth. One method may be much more effective but the cost may be prohibitive. Another may be cheap and effective but requires more time than is available (6).

It is important to mention that good communications is an essential common ingredient to a successful training

program whatever the training procedure was (7). Thru good communications the message is clearly passed from the trainer to the trainee and effective training is achieved.

The first type of training practice is delivering a lecture and/or a conference. Such a training procedure is characterized by one (and rarely more) trainer offering the training program to many trainees. The **lecture/conference** is one of the most widely used training practices. Even companies that use other training practices utilize lectures and conferences for additional benefit. One disadvantage of the lecture/conference is a high possibility that distractions will occur. As the trainer is passing information to the trainees, the latter may be distracted, thinking of a personal matter or just day-dreaming. However, this type of training practices is usually cost and time effective since it involves many trainees at the same time (8).

The second kind of training practices is the **laboratory work**. Lab work is usually used in scientific fields like Biology, Chemistry, Pharmacology, Geology and in some industrial production fields. This type of training practices is characterized by a high degree of specialization on the trainer's side since it requires accuracy and detailed knowledge of the training material. Lab work is one of the most costly training

practices but other traditional training practices can not take its place because of the previously mentioned characteristics.

The third type of the training practices is the **manual skills** training. It is widely used in large production firms and assembly lines. The trainees undergo this training program to increase their efficiency and speed in production. This training practice is sometimes used in artwork and craft work like engraving on jewelry . The trainer in mechanical training is usually the direct chief or supervisor thus personal relations among the trainer and the trainee is important.

Finally, there is **on-the-job** training. This type of training usually involves one trainer offering training to one (and rarely two or three) trainees. Thus, it is less frequent that distractions will occur, and more probable that understanding is achieved. Besides, the training is occurring in a real situation under nearly actual conditions. As in the case with mechanical training, the trainer is usually the chief / supervisor or a peer of the trainee, emphasizing the role of personal relations between the two. Time can be considered both an advantage and a disadvantage. In general it is faster to train the person right on the job. However, it isn't the most efficient way to train large groups of people. Some distraction may occur in this kind of

training from the noise of equipment, machinery, conversations among other employees, etc. (9).

From the previous paragraphs is obvious that each type of the training practices has its own advantages and disadvantages, and has certain fields where it is most efficient. The decision to choose one practice or another, or a combination of them, depends on the kind of job, nature of training material, and qualities of the trainees and the trainers.

B-Multimedia Technology.

Every decade witnesses a new revolution in computer technologies. Starting from the first commercial computer in the 70's where computers used to display text and numbers. Then, people started to see images being displayed on the computer. Next, was a giant step in digitizing sound, and finally we came to a stage when we can actually watch live video, listen to sounds, view images, and read text all in a completely integrated computer-based environment.

1. What is Multimedia.

"Multimedia is a computer that can store, display and manipulate text, graphics (in two or three dimensions), animation, sound and video all within a digital environment" (10). At this point, we need to differentiate between the analog and the digital worlds. The former includes all the real signals (that are continuous) which we encounter in our daily life like the audio signals coming out of the radio or the video signal from TV. The latter is composed of the encoded computer signals that are stored inside memory or on a disk. Figure 3, illustrates these two concepts and shows that multimedia is offering a new environment that is totally different from the usual audio-visual equipment that people encounter today.

As a multimedia application is purely digital and stored inside the computer, one can easily control it by the use of software programs. For example, video can be digitized on a hard disk as a normal file that the user can load and play. Also, one can re-size the frame or crop it. The integrity of all these media will offer the advantage that a computer program can now include all of these components at once and display them at the same time. A high degree of interaction exists between the user

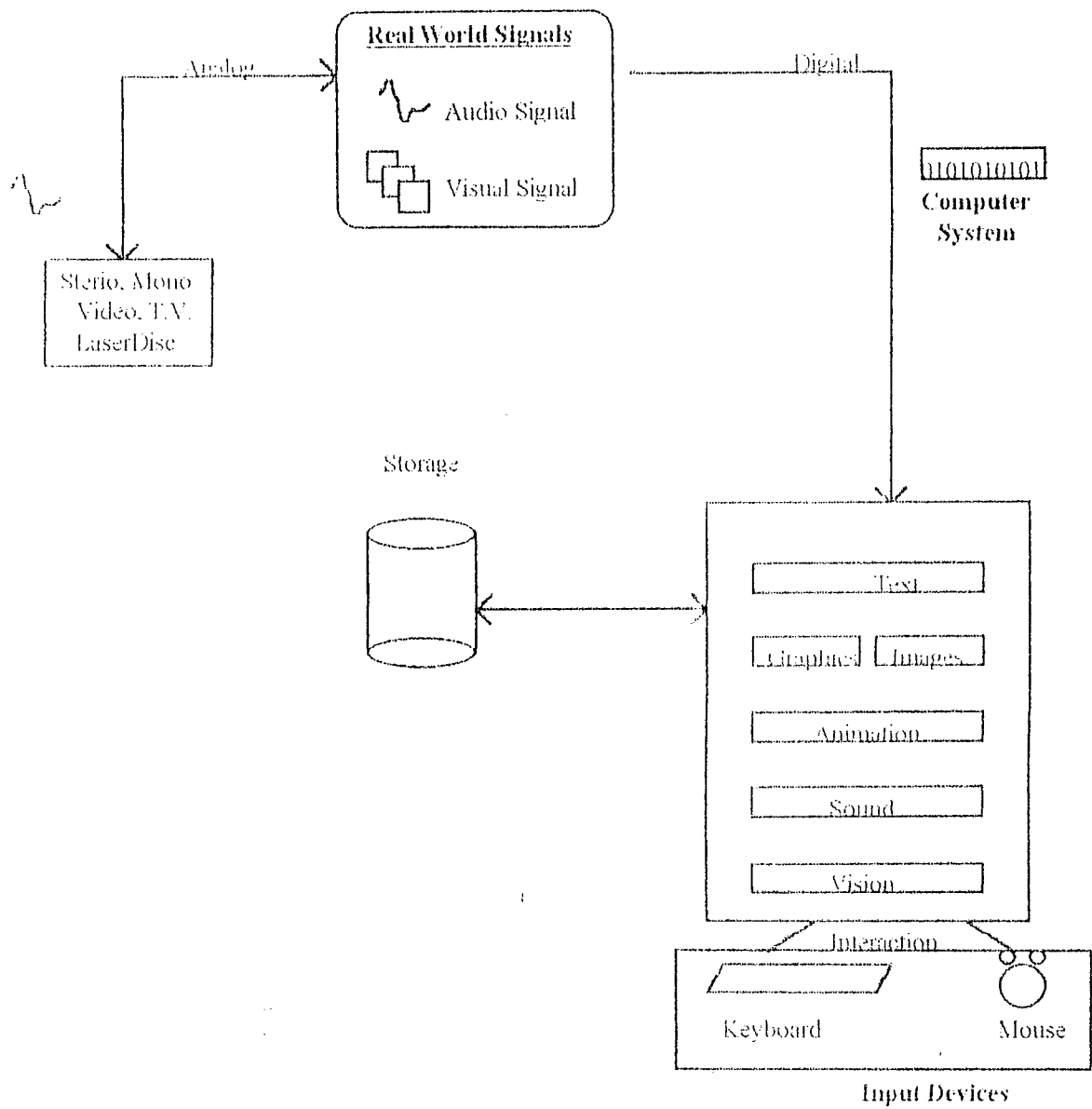


Figure 3 Analog vs Digital World.

(Source : Multimedia : A new World of Computing.)

and a multimedia application, through the use of a keyboard or mouse. An application developer can define the level of interaction, so that the user will have the capabilities of exploring every element on the screen (11).

2. Components of a Multimedia System.

A multimedia system consists of several elements. This does not only include a computer system, but also other peripherals and devices that are needed in order to convert from the analog world to the digital world. Also, there are two categories, the development system and the delivery machine.

The basic components of a development system include

- Computer system.
- Software.
- Add-on boards.
- Image scanning.
- Sound equipment.
- Video equipment.

The computer system needs to have fast processing speed and a big memory. A large storage device is needed in

order to store the enormous amount of multimedia files (a 1 second of digital video that is used in a multimedia application might take up to 8 million of bites). Examples of such devices might be a hard disk, a CD-ROM (Compact Disc Read Only Memory), or a re-writable Magneto-Optical drive. The supported graphical resolution is very high (in the order of 800 x 600 pixels and more). Input devices range from keyboard, mouse, pen, scanner, joystick, or a digitizer. Also, printing devices are recommended in order to have "screen dumps" of the application. In this case, it is preferable to have a color laser, thermal or ink jet printer.

Software needed is of different types and categories, like authoring system, programming language, operating system multimedia extensions, graphics software, and digital video/sound editing software, etc.

The delivery machine or system is not as complicated. An ordinary personal computer is enough, on condition it has the capability of running good quality graphics, and the potential of installing new devices (like sound card and a CD-ROM drive) (12).

3. Production of a Multimedia Application.

Multimedia production is like the production of a movie and the writing of a book. There should be a team divided into subgroups where each will be assigned a task. Figure 4 shows the various steps in developing a multimedia application. First of all, a subject matter expert will define the application content, then start analyzing the different aspects of the application. In parallel with this, a team will start collecting and digitizing all the raw materials for the project (like images, sound, video, etc.). This appears on the right-hand side of the figure. The instructional designer will collaborate with the expert on designing the application (deciding where to place the different elements on the screen, and the level of interactivity). After this the software engineers will assemble everything and develop the actual program by linking all the multimedia elements and coding the interactions. All these steps are on the left-hand side of the figure.

Like any other project, the final outcome needs to be tested before delivery. Feedback from users is essential in order to enhance the look and interactivity of the software. Finally, the multimedia application can be mastered on a CD-ROM where

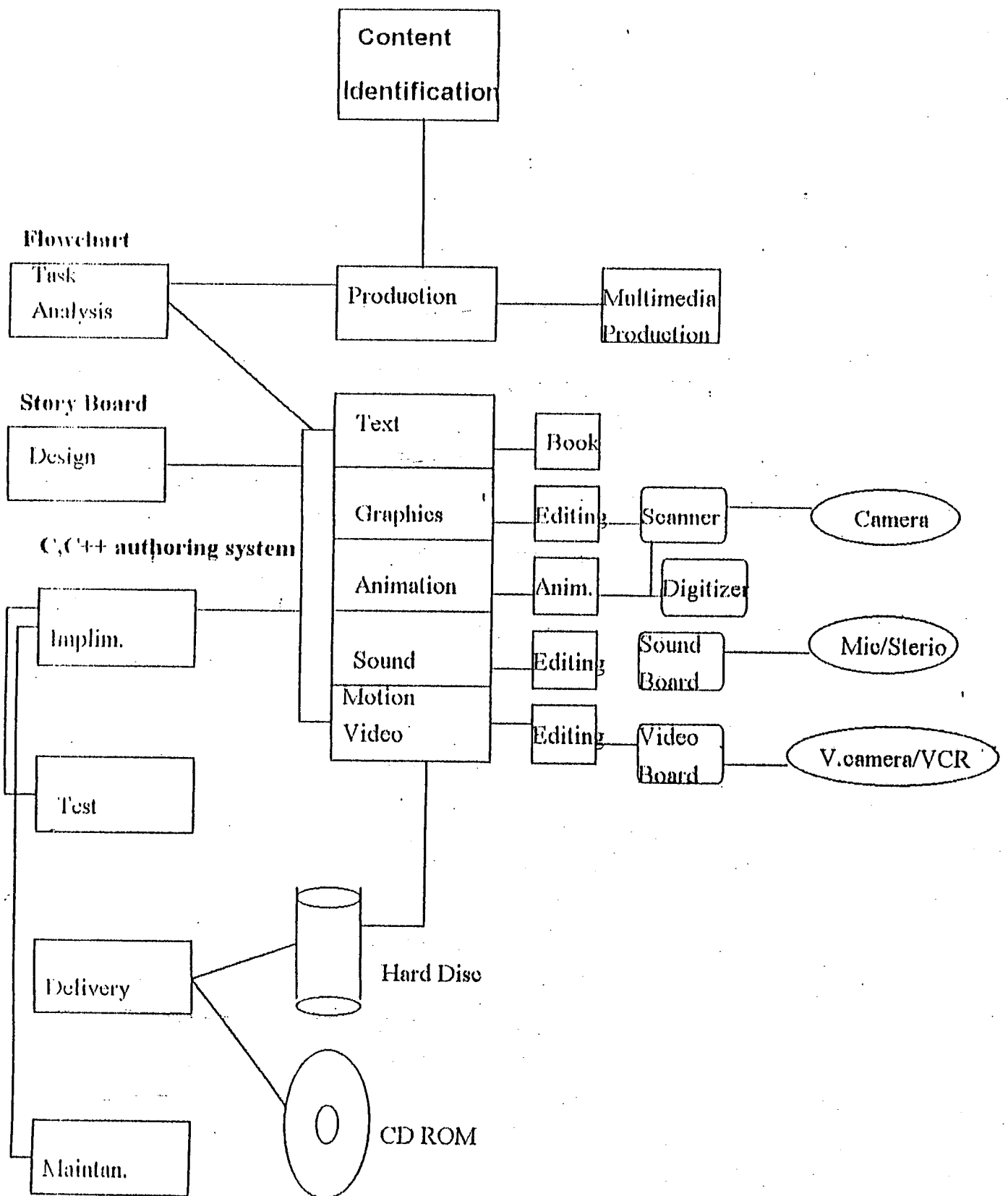


Figure 4

SOURCE : AUTOMATED TRAINING DEVELOPMENT SYSTEMS.

one can store all the text, images, sound, video and the interactive program (13).

4. Application Areas of Multimedia.

Multimedia has a very wide scope of applications. Approximately, every bit of information can now be stored in the computer and displayed with new digitized audio-visual elements. All books, newspapers, catalogues and other printed material can be transformed in a multimedia look, and therefore offer the user a better understanding of the information that is being displayed to him through the illustrations using text, graphics, sound and video. So, the user will have no reason at all why he couldn't understand.

The very first application of multimedia is in education, where students will be using a multimedia system to assist them in understanding better the new and sophisticated concepts taught in class. For example, there are difficult concepts in Physics that need a lot of visualization. In this case, one will refer to a software that will not only teach the student this new idea, but show him a video or an animation of an experiment that he will not be able to see in his life (for example electrons colliding with each other). In Chemistry,

there are applications where a student can mix and test chemical equations on the computer, and the multimedia application will show him a live video of the result. This is very useful when such experiment can not be done in a laboratory, being hazardous, or producing bad odors, etc.

Another application is in business, where multimedia can be used to assist customers in finding the right merchandise to buy, or to help the sales person to better convince the customer about a specific product. In other words, multimedia will help in producing a "talking catalogue".

Multimedia is also used in libraries, museums and touristic attractions. In this case, a multimedia system would be installed on site, and the information-seeker would use it in order to find out more about a book, a historical event, a city, or even to reserve a hotel room (14).

C-Multimedia in Training Programs.

1. Automating the Training Programs.

As computers entered the business field in the 70's , it was only a matter of time for all managerial functions to start

benefiting from the use of computers. Training wasn't an exception.

In 1988, and according to survey done by Datamation covering 120 representative U.S. corporations in 15 industries, companies spent around 2% (or around 32 billion dollars) of their annual revenues on mainframes and centralized information systems. (15). This figure doesn't include investments on decentralized systems and personal computers. Personal computers (PCs) used in business experienced a great jump. More than 12 million PC with other related automated tools are currently in the hands of health, educational and banking professionals in the United States. (16) James Martin, a computer expert who for more than 20 years has been documenting the automation age in various books, projected that by the year 2000 all white-collar workers will have a PC at their disposal.

At the beginning, and since trainers tend to regard people as the focus of their job, they dealt with the computer as a background issue, not germane to the basic thrust of their work. That is why computers remained on the periphery of training development (word processing, scheduling) rather than at its center. Yet, as hardware capabilities developed and increased, and the variety of softwares widened, computers

acquired greater importance and Computer-Based Training (CBT) became a common ingredient in the personnel departments of the larger firms. Some training packages acquired international recognition such as Phoenix (for mainframes), and Pilot, TenCORE and Phoenix/Micro (for personal computers). (17). According to Training magazine, around 83% of the large companies are using computers in some training capacity. However, many of these companies are using computers in only secondary roles, like typing training material or tracking the attendance records and class schedules. In smaller companies the use of computers in training is less frequent (18). One might conclude that smaller firms either have limited need for the use of computers or a limited budget. In fact, a small firm may not have multiple facilities, offices or departments, and the majority of employees are in one location (building - office) with a less formal environment. Employees might have diverse functions in the firm with interchanging roles. However, this fact is a major reason for the management of the firm to provide its subordinates with enough skills in various fields, not to forget the company's need for growth and development in order to be able to compete with the larger firms.

Training supports many objectives of the corporation. This issue was discussed earlier. What is important at this

instant is to emphasize the fact that since training leads to greater worker productivity and thus greater corporate revenues, most of the large firms invest generously in the training field. According to Training magazine, U.S. businesses with 100 employees or more spent around 40 billion dollar on formal employee training. In the year 1990 this figure increased by 12%. More than 70% percent of this investment consisted of training personnel salaries.

2. Multimedia in Training Programs.

People look high at computers and always expect a lot from the "intelligent machines". However, at many instances computer users were faced by some limitations in the abilities of computers such as low processing speed while using complicated software, and limited memory which further narrows the horizon of the used software. Computer engineers had their solutions ready. With the last generation of processors (such as Intel's 486) the processing speed was tremendously improved. In turn, the compact disc (CD) could solve the problem of limited storage ability. Based on these improvements, and thrilled by the idea of adding voice, image, motion video and animation to text

and graphics, engineers dwelled into a new world of computing, the world of multimedia.

The technological advances in the computer industry, both in terms of hardware and software, provided additional benefits for computer users in all fields including training. At the beginning people involved in the training function were skeptical about this new technology and its uses, the same way they were suspicious about the benefits of computers. However, some pioneer companies were challenged by the thrilling characteristics of multimedia and decided to take a step ahead. The satisfactory results that were achieved encouraged other companies to use multimedia in training and the cycle is still in its first turns. Following is a case study reflecting a real experience of a company that used multimedia in training.

3. Multimedia at Union Pacific : A Real Experience.

In 1989 Union Pacific (UP), a transportation giant based in Omaha, USA, made a commitment to multimedia training as part of an \$ 89 million project designed to improve its service, which had slipped during decades of railroad regulation. And they have not looked back.

At that time they were struggling to improve service reliability using a computerized Train Control System (TCS) which promised to improve communications and increase productivity by processing data from centralized locations. However, its success depended on the cooperation of a diverse network of employees - from train conductors and customer service representatives to field operations managers and marketing personnel - and many of them were not cooperating. The company-wide downsizing that took place in the mid eighties, plus extensive restructuring and relocation, had taken their toll. The rift between managers and front-line workers was damaging the communication network and affecting service reliability (19).

Union Pacific looked to multimedia training to help solve these problems and selected Allen Communications, a well known institution in course-ware development, hardware integration, and Quest multimedia Authoring System, to help develop UP's training program.

To help heal the rift between management and front line workers, Allen created first an overview course that addressed UP employee concerns, explained what the company planned to do and showed how workers' jobs would be impacted.

The MTV style music video boosted morale and motivated employees for the training that followed.

UP now uses multimedia course-ware to train various employees in the service reliability network. Technical training courses and on-screen simulations teach 7,000 conductors how to use on-board computer systems to report train movement through the TCS system. 1,000 customer service personnel at UP's National Customer Service Center (NCSC) learn to produce work orders for conductors and process freight orders via the system. About 700 field operations personnel learn to work directly with conductors to carry out transportation plans according to TCS standards. Other courses teach 350 managers at the Hariman Dispatching Center how to follow TCS procedures. An overview course on service reliability shows how the success of the TCS system depends on the cooperation of all.

UP courses provide high level interactivity, focusing on real world application of skills rather than learning of rules or abstract guidelines. During the training, employees make decisions, listen to feedback, answer questions, solve problems, and vigorously test their skills (20). "Employees' attitudes change dramatically when they discover the interactivity these courses provide," said Robert Bates, a senior instructor involved in the training course. "At first they try to sit back and glide, but the

training demands their attention. They say." He added. As one trainee mentioned "This course will chew me up if I don't get involved"

Real world scenarios simulate typical work situations that employees will face. They learn how to use the TCS system by working thru scenarios and interactions with other members of the network. Video testimonials and interviews help employees learn how their fellow workers and others in the network feel about issues and problems. Trainers respond to these testimonials on a graded scale. This data is stored so later they can see how their attitudes change. Other interactions require trainees to choose between three strategies for solving a problem. They watch video segments that explain each strategy, choose an option, and then watch the consequences of their choice. This teaches them to carefully distinguish between good and bad advice from other employees (21).

4. Bottom-line Results : A Real Success.

The bottom line is that UP's multimedia training is working. David Dwerlkotte, the director of UP's training program estimates that trainees are learning 30% faster and

retaining 40% more than in traditional training. 90% score even higher after they got used to the multimedia environment.

"No one is failing these courses. In fact, the courses have helped us identify people with reading disabilities so we can provide the specialized training they need. We never could have identified these problems with traditional training. With multimedia we can define real performance levels. We know what they know when they leave the course."

According to senior instructor Bates, multimedia courses have reduced training time by 50%. "Cuts like these will add up quickly. When you take someone off the job to train him, especially in a union environment, you often have to fill their job by paying someone else overtime," Bates said. We estimate development costs for the conductor's course is about \$33 per student. Even the courses with a smaller audience, where the cost is about \$600 per student, are well within industry training standards, especially when you consider costs of travel, time off the job, overtime, training facilities, and support staff," Dwerlkotte said.

In short, the results have been so impressive that UP is expanding its multimedia training to other areas such as sales and marketing, human resources and maintenance. Dwerlkotte projected that over the five year period ending in 1994, the

company will save at least 35% in training costs associated with its service reliability improvement project because interactive video courses have eliminated the need for trainers to travel from site to site. Over \$3.5 million has been budgeted for course enhancements and future developments aimed at over 15,000 employees.

"At Union Pacific, we are committed to multimedia. We have set up a standard and we plan to stay with it," Bates said. "Once you have driven a Cadillac you can't go back to your old Chevy." (22).

Although this was a relatively elongated example, yet, it is important as it reflects all phases that a company passes thru when it decides to use multimedia in its training programs. It starts with a managerial tendency to improve productivity, thus requiring among other things a modern training program using multimedia. At the beginning, the company is faced with employee hesitation, skepticism and relative alienation, then it experiences better employee involvement in the new training program as the employees discover its qualities and are attracted to its lively environment. The process ends in a corporate benefit expressed in higher employee motivation and better productivity. It is also worth mentioning that other major

corporations such as Ford Motor, IBM, Fiat, and Bethlehem Steel Co. passed thru similar experiences and ended in similar results (23).

ENDNOTES.

1. John Toigo, Automated Training Development Systems, p. 12.
2. James Pond, Effective Training Development Skills, p.1.
3. James Pond, Effective Training Development Skills, p.1.
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16. John Toigo, Automated Training Development Systems, p. 5.

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19. Steve Cantwell, "Multimedia Transforms Unions Pacific's Training Strategy", Tech Trends, p.21.

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CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

In chapter two, literature reviews have been used to discuss the different training practices, and the proper way of developing and delivering training programs. Also, multimedia technology was analyzed identifying its development, components and uses. Then multimedia based training was discussed and a real experience of multimedia use was reflected in a case study.

A. Research Purpose.

This study has been conducted to explore and describe multimedia technology and the training methods used before and after incorporating the technology.

Also, this research study will attempt to identify the implications of using multimedia in training programs in Lebanon reflecting peoples' perceptions of multimedia technology.

B. Sources of Information.

A field survey was used to explore the training methods used in preparation of Lebanese employees. Furthermore, the survey also explored whether multimedia technology is used in the training sessions offered to the employees.

Another technique used was the structured interview approach. This approach was used to gather data from experts on the field of multimedia technology existing in Lebanon. Therefore, an interview was conducted with Dr. Ali Hejase of Future Publishers.

C. Survey Design.

Concerning the questionnaires, Two formats were developed. The first is used to get information about the type of training employees are currently getting, and to know how familiar are they with multimedia technology and its different uses - especially in training. A copy of the questionnaire is found in the appendix. The second format was developed to weight the characteristics of multimedia when used in training. It was intended to be distributed to people who have used multimedia in training. Unfortunately, since none of the

respondents did, this format of this questionnaire couldn't be used. A copy of this questionnaire is found in the appendix.

The Sample of respondents chosen was a selective one. The 50 persons to whom the questionnaires were distributed were chosen to be in their twenties. The reason behind this is that multimedia is a new technology. It is not expected that elder employees have encountered multimedia in training, especially that the majority of training programs are delivered at the first months / years of work. Besides, young employees are expected to be more involved in new technologies as they are either fresh graduates or continuing their studies. The histogram in the figure reflects the age distribution of the respondents. As for the sex of respondents, almost half of them were males and half females. (Pie 1 in the figure). The majority of the respondents (88%) were graduate students. (Pie 2 in figure).

To get more information about multimedia and its uses, an interview was conducted with Dr. Ali Hejase who has personal experience in this field and who is the only technical manager producing multimedia applications in Arabic in the Middle East. Dr. Hejase forecasted the future potentials of this new technology in Lebanon..

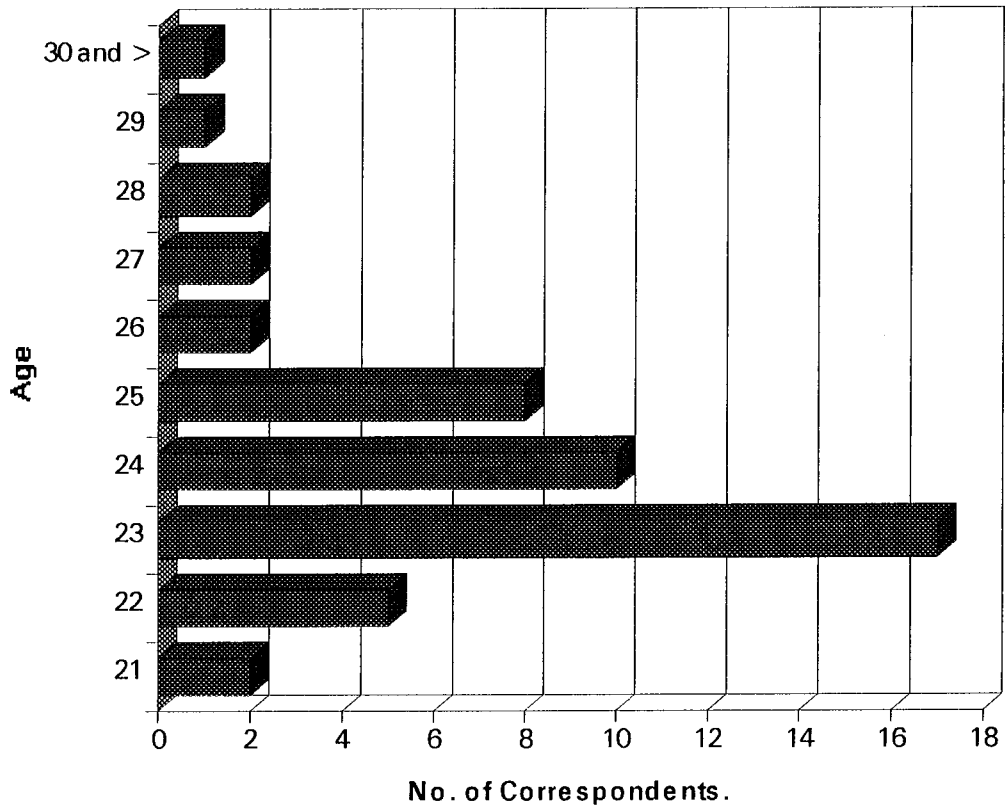
D. Data Analysis.

Responses were analyzed using descriptive statistics, since the amount of data obtained is not significant to run statistical analysis using advanced packages due to the fact that multimedia is not used yet in training in Lebanon.

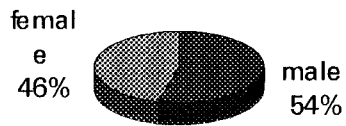
To cover the deficiency of data availability, information gathered from secondary data and that collected from the interview will form an exploratory basis for the future implementation of the technology in Lebanon.

Chapter four will present the analysis and findings of the collected data.

Age Distribution.



Sex distribution



Education level

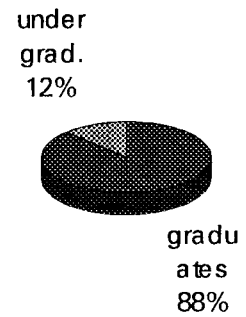


Figure 6.

CHAPTER FOUR

RESEARCH ANALYSIS AND RESULTS

A-Characteristics of Training Programs Using Multimedia.

It is natural when a new technology is analyzed to weigh its cons and pros, that peoples' opinions may vary due to the subjectivity that affects their attitudes not to forget previous conceptions that some people may already have. Thus, the characteristics that will be discussed are the most important ones; those that are almost agreed upon. Most of these characteristics involve technical assistance that multimedia provide to its users especially in the training field. These characteristics were previously visualized in the example mentioned before.

1- Direct feedback.

Direct feedback means that the computer will directly respond to the answer\action of the trainee approving him if the answer was right, and correcting him if his answer was wrong.

Direct feedback is considered a major characteristic in any learning process. If the feedback is a delayed one, there is a greater possibility that the trainee would be confused, and in a short time will forget what was the correct answer. Besides, the trainee will not move into a following step unless he is sure of all the previous steps.

2- Interactivity.

Training using multimedia is highly interactive. There is always an ongoing two-line communication between the trainee and the trainer (the computer). This vivid environment has many advantages. It helps in attracting the attention of the trainee and encourages him to be involved in the training program. The interactive environment provides a comprehensive way of learning. It shows the trainee all the alternatives of action providing him with detailed information about each. This information reaches the trainee in a systematic way helping him to keep an overall look about his work. Besides, it is agreed upon that a person learns most when he himself hunts for information and finds it. Ultimately, there is no better way for a person to search for information than using the interactive multimedia. In the example of Union Pacific, the director of the

training program estimated that trainees are learning 30% faster and retaining 40% more than in traditional training.

3- Tutorial teaching.

One of the most important qualities of training using multimedia is that actually there is a trainer for every trainee. This can help in many ways. Employees differ in their knowledge, technical abilities, perception abilities, reasoning, etc. With a traditional training program, all of them are treated alike irrespective of the individual differences. All employees are given the same time to understand and practice and all are expected to move at the same pace with the rest of the group. However, with a training program using multimedia each trainee works alone on his PC. He proceeds in the training program according to his abilities and this provides him with the opportunity to excel in his work and reach the level of his colleagues. The weak employee can use the multimedia training program in his off times to increase his abilities and catch up with other members of his group. Besides, and as revealed in the case of Union Pacific, employees with some disabilities like reading disabilities, are recognized and thus could be helped to overcome their problems. Another advantage that training using

multimedia provides is that since each trainee is working alone, he would be highly involved in answering the questions and choosing among alternatives and wouldn't be shy or afraid that his answer or choice is wrong since nobody will know about that.

4- Simulation and real life scenarios.

One of the most significant characteristics of training using multimedia is that it can produce typical work situations that employees will face in their work. Trainees will work thru scenarios that demand them to make choices among alternatives and select strategies for solving a problem and then watch the consequences of their choices. Scenarios will also help trainees visualize the relation between their work and the work of their fellow workers. In these simulations a wrong choice is corrected, but in real life a wrong answer might bring a disaster to the employee as well as the company. Thus, these simulations are in fact work experience beside being training means.

5-Experimenting on computers.

In some fields like industrial Physics and chemistry, some experiments can be very dangerous to be done in a laboratory. Poisonous gases and materials, explosions, etc. can be avoided by doing the experiments using multimedia. Multimedia will simulate the experiment showing all the phases of the reactions, reflecting all changes in materials, and producing the same results that are produced in a laboratory.

6-Time effectiveness.

Since multimedia provides a more comprehensive alternative in training practices allowing trainees to understand faster, and since its tutorial characteristic provides trainees with the opportunity of working on the training program in their extra times and off-hours, it is clear that training using multimedia is time effective. This issue is very beneficial for companies. Employees are practically unproductive during the training period. As much as this period is shortened (on the condition of not affecting the quality of training delivered) the company would be increasing its productivity. Moreover, during the training program some other employees should be doing the job

of the trainees which mean extra charges for the company in terms of overtime or bonuses. If the training period is minimized the costs are minimized.

7-Cost effectiveness.

All the characteristics mentioned before might be outweighed by the issue of cost effectiveness. Although human resources are gaining more importance in the modern organization, yet in many cases managers (especially in our part of the world) can not tolerate big figures being allocated for titles like training, research, etc. Thus, the idea of using multimedia in training programs should financially appeal to the management of a company to assure a positive response from it. The costs of training using multimedia should be compared to the costs of traditional training to be able to find if the former is costly efficient. It is of relevance here to give an idea how the training costs in a traditional program are divided. Figure 6 reflects the breakdown of the training budgets in large organizations in the United States.

From this figure, it is clear cut that the biggest part of training costs (70%) are salaries for training staff, a burden that is released thru the use of multimedia. Even other items that

constitute the training costs in a traditional program (off-the-shelf materials, custom materials) are absent in multimedia as it is substituted by motion video, animation, etc.

Breakdown of Training Budgets

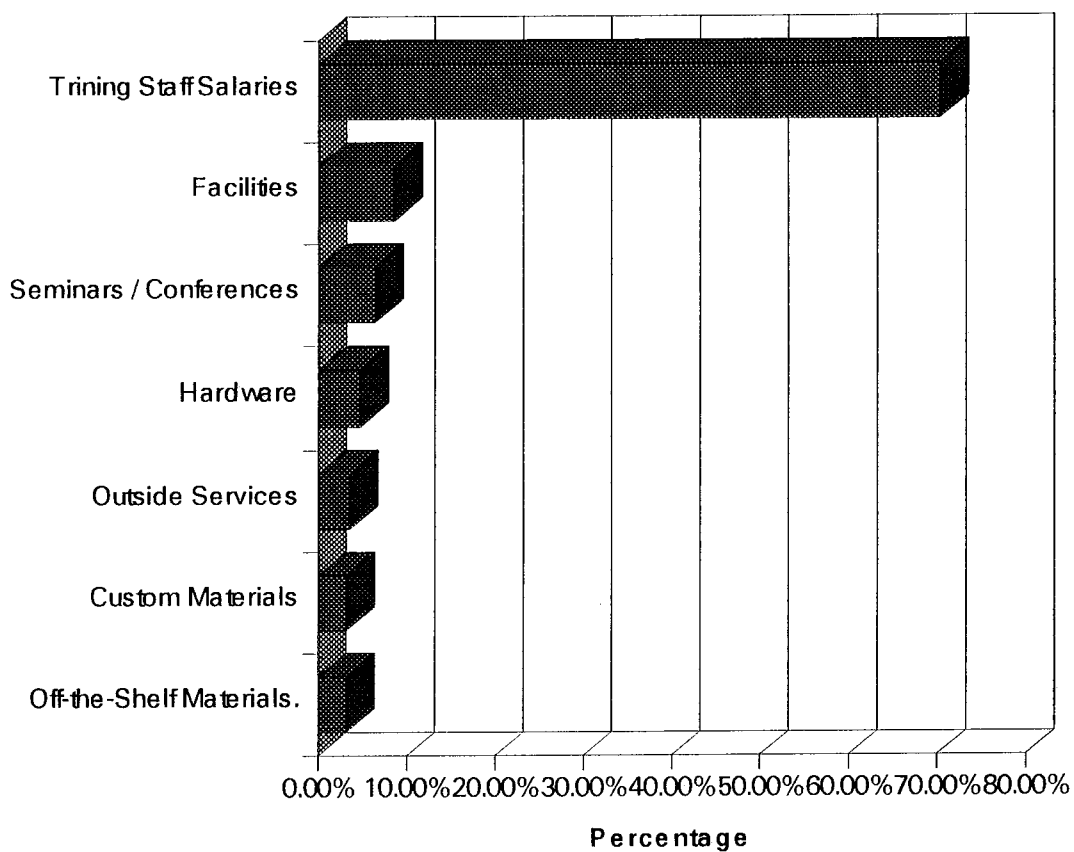


Figure 6. Source : Automated Training Development Systems.

The costs of using multimedia in a training program are of two types : Costs for developing a multimedia training application that fits the company, and costs for delivering the application (PCs, MM accessories - CDs, sound cards and speakers, etc.).

The second type of costs is the substitute of using off-the-shelf materials, custom materials and hardware in traditional training. Most of the organizations already use computers in its operations and only need to purchase the accessories. The cost of these accessories per one computer floats around \$600, less than the cost of one slide projector or a photocopy machine.(An offer for multimedia kit can be found in the appendix.)

As for the first type of costs which is the cost of developing a multimedia application, it varies according to the nature of the training program. A sophisticated multimedia training program may cost more than a traditional program. However, once the multimedia training program is developed, it can be used so many times without additional costs. While each time a company wants to start a traditional training program it should pay the same costs again and again. Thus, it is cost efficient for an organization to use multimedia for training.

From all these characteristics we can know that its more efficient in all terms for an organization to start using multimedia based training programs. Such programs will reflect positively on the organization by motivating employees to acquire new skills, and providing these skills to the trainees in less time, fewer costs and more efficiency.

B-Training and Multimedia in Lebanon.

1. Questionnaires.

i- Training.

Eight questions were placed in the questionnaire seeking information about the characteristics of the training that the respondents have had.

--Attendance of training programs.

The answers of the first question revealed that 40 % of the correspondents attended some kind of training program, while the rest 60 % didn't attend any training (figure 7). Thus,

the answers of the rest 7 questions about training will only be answered by those 40 % who had training.

<u>Had training</u>	<u>No training</u>
20%	40%

--Place of training.

95 % of the respondents who attended some sort of training program had their training in the institutions where they work. Only 5 % had training in specialized institutions (Figure 7)

<u>At company</u>	<u>At special institutions</u>
95%	5%

--Duration of training.

Most of the respondents - 70 % - said that the training program extended less than 30 days. 20 % had a training program that extended from 30 to 90 days and only 10 % had a long training program - more than 90 days (Figure 7).

<u>Less than 30 days</u>	<u>30 to 90 days</u>	<u>more than 90</u>
70%	20%	10%

--Type of trainers.

In 90 % of the cases the trainers were company executives. The rest 10 % had a specialized trainer (Figure 7).

<u>Company executives</u>	<u>Special trainers</u>
90%	10%

--Number of attending trainees.

As for the number of trainees attending the training programs, 70 % of the respondents attended a program with less than 10 trainees, 20 % attended a program with 10 to 25 trainees and only 10 % had programs with more than 25 trainees (Figure 8).

<u>Less than 10 trainees</u>	<u>10 to 25</u>	<u>more than 25</u>
70%	20%	10%

--Type of training.

40 % of the respondents said that the training they had was on-the-job training, 5 % had lectures, 10 % had technical training, and the rest 45 % a combination of all.

<u>On-the-job</u>	<u>Lectures</u>	<u>Technical</u>	<u>Combination</u>
40%	5%	10%	45%

--Use of computers in training.

As for the use of computers in training, 30 % didn't use computers, 70 % did. Half of the 70 % used computers for more than 2/3 of the training program, 29 % used computers for 1/3 to 2/3 of the training program, 21 % used it for less than 1/3 of the program (Figure 8).

<u>Did not use</u>	<u>Use < 1/3 Tr pr</u>	<u>1/3 to 2/3</u>	<u>>2/3</u>
70%	15%	8.7%	6.3%

From the preceding paragraphs, the following picture can be drawn about training in Lebanon. First, training still hasn't receive the proper attention from managers as a very important and constructive step in building efficient and skilled human resources. Even in the companies that have some kind of training, this function is still immature. Training is provided in a simple form to the new employees by some of their senior colleagues. In most of the cases it is an employee-employee training. The duration of training is usually for few days until the "new comer" is familiar with the job and can continue on his own. Training takes place on the "scene of the job". Due to the wide use of computers in many fields, companies are taking into consideration this fact and including computer in training. Thus, training still fall short from achieving its full purposes.

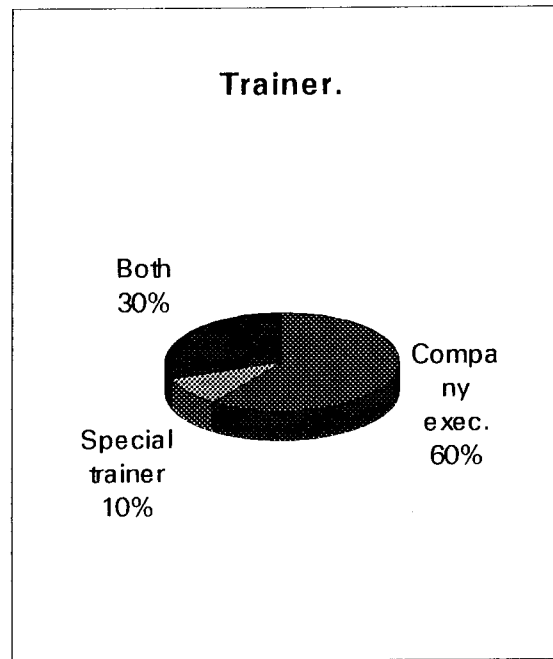
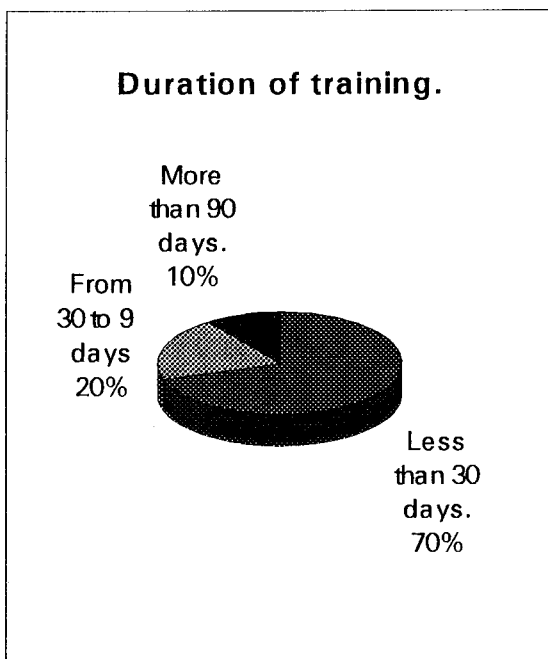
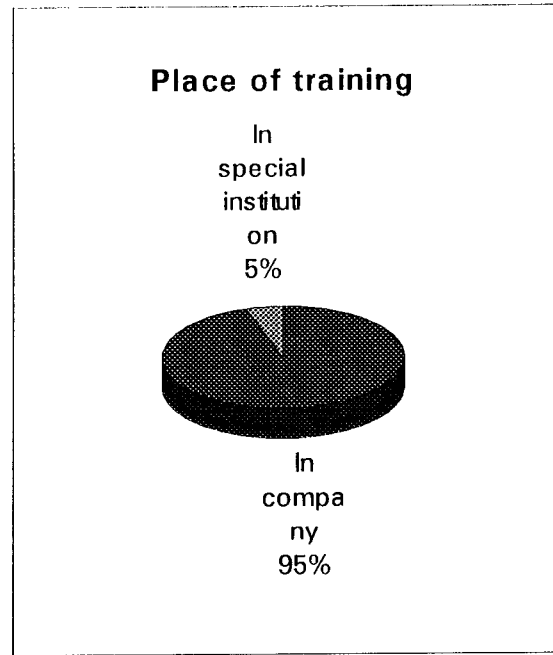
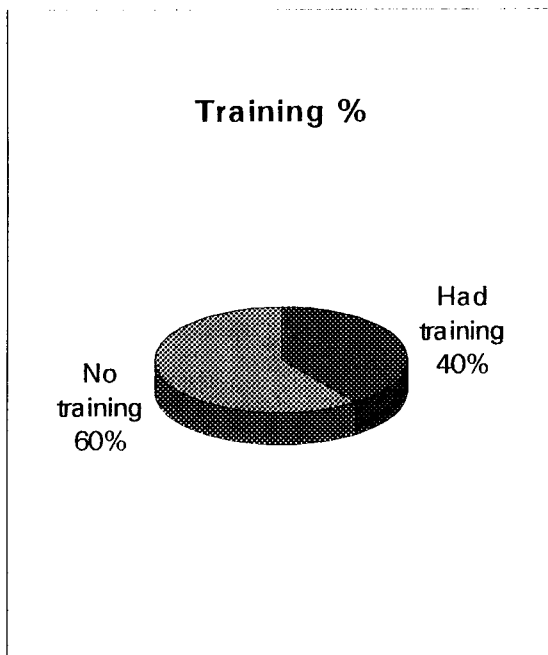


Figure 7.

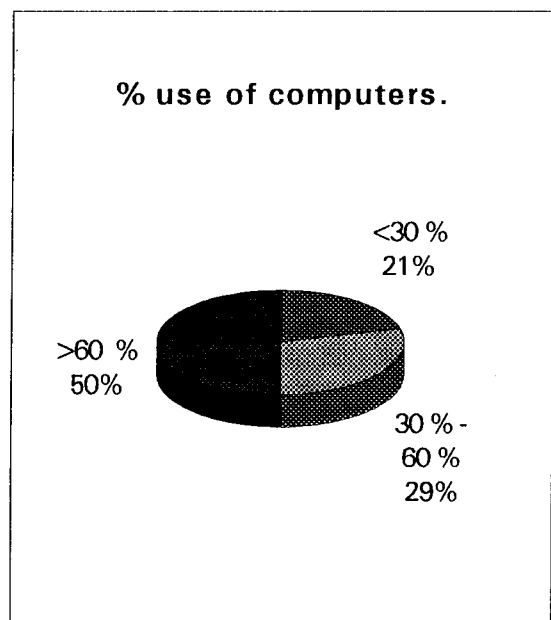
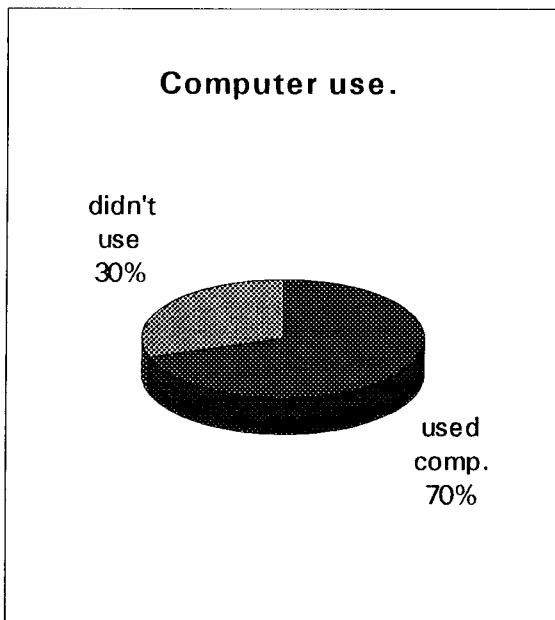
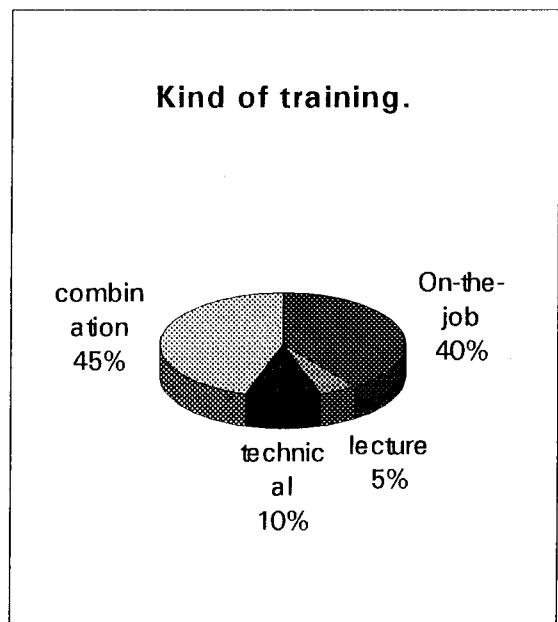
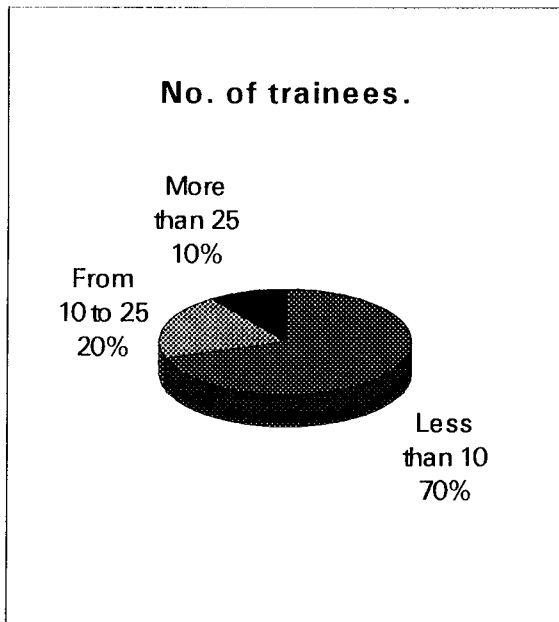


Figure 8.

ii. Multimedia.

There were seven questions about multimedia in general.

Heard about multimedia.

From the first question, it revealed that 60 % of the respondents haven't heard about media and 40% did (Figure 9).

<u>Heard About multimedia</u>	<u>Not heard.</u>
40%	60%

What is multimedia ?

The majority of those who heard about multimedia said it was a technology, 5 % said it was a computer and 15 % a combination of computers and software (Figure 9).

<u>Technology</u>	<u>Computer</u>	<u>Combination</u>
80%	5%	15%

Use of multimedia.

Out of those who heard about multimedia only 35 % used it (14 % of the whole sample) (Figure 9).

<u>Used multimedia</u>	<u>Did not use multimedia</u>
14%	86%

Place and nature of multimedia use.

All those who used multimedia did that in their work. four respondents used multimedia in business (sending and receiving faxes, answering phone calls, etc.), one used it for education, one for entertainment (games, music), and one for both entertainment and education.

All respondents who used multimedia favor its use, and only one of them said it needs special training to use it.

Thus, as we see multimedia technology is still unfamiliar to most people. The few who encountered it did so at work and for little time. Multimedia technology still has a lot of qualities to show to its users.

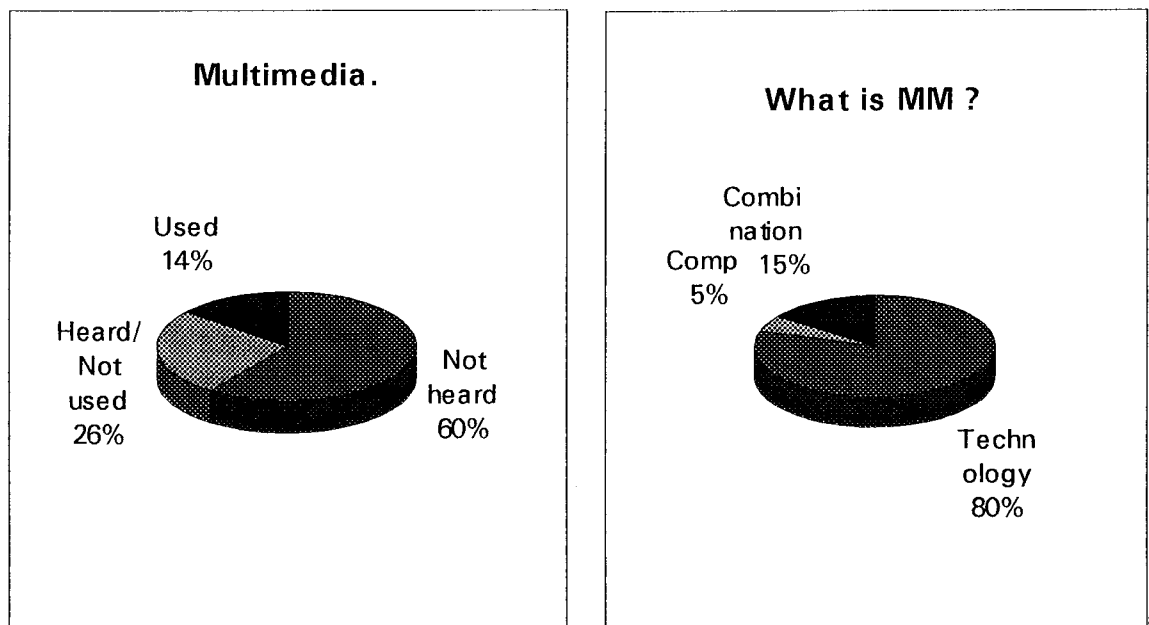


Figure 9

iii. Multimedia in Training.

None of the respondents have used multimedia in training. Thus, no one could evaluate its use in this field.

2. Interview with Dr. Hejase.

An interview was conducted with Dr. Ali Hejase, the technical manager at Future Publishers. Future Publishers is one of the daughter companies of Apple computers and is located in Verdun street, Beirut. It is the first computer company in Lebanon and the region to produce commercial multimedia applications. Previously, computer institutions in the Arab countries were using Hypercard software to produce their applications. Future Publishers is the first to produce a real multimedia applications. The first of these applications was an Arabic application about the geography of Lebanon and is named "Lubnan, Louloat Al Shark". This application provides information about the location, nature, population, economy, culture, tourism, and history of Lebanon.

Dr. Hejase besides his work in Future Publishers, has worked at the American University of Beirut in the Engineering

Department, and Beirut University College in the Computer Science graduate program.

The first question was about the general status of multimedia in Lebanon. Dr. Hejase said that multimedia has only recently entered our country. It is still unknown to the majority of the population. Multimedia is in its introductory phase and only few persons have used it. The main use of multimedia in Lebanon now is in youngsters' education. Many applications found in the market can be used to increase general knowledge. There are also special software in fields like Mathematics, English, Geography, etc. Some schools (like ACS and International College) are working on introducing multimedia technology as an assistant media for education.

There is a variety of multimedia software in the library of Future Publishers, as well as books about this technology. Prices of multimedia applications range from as little as \$18 to as much as \$800. The sales people at F.P. face a customer who knows nothing - or in best cases very little - about multimedia. Even the companies' managers and top executives are still alienated from this technology.

Since multimedia is in its introductory phase, the role of sales people is to create enough knowledge about multimedia in the minds of customers to initiate them to study the possibility of benefiting from this new technology. The next step

would be offering customers multimedia applications each according to his need and line of business.

Dr. Hejase estimates that within two years, multimedia will be used in the field of vocational training. In this period, more people would be introduced to multimedia and its different uses. Customers will determine what do they want to include in the training program, and computer experts will transfer the ideas into a real application on a CD.

Finally, Dr. Hejase said that he believes that the future of multimedia will be a positive one in all fields. He and his colleagues at Future Publishers are doing their best to pave the road of multimedia applications in Lebanon.

CHAPTER FIVE

CONCLUSION

Before drawing the conclusion of the study, it is beneficial to restate some points that were mentioned in the study.

A. Limitation of the Research.

The aim of this research is to analyze the training practices used before and after incorporating multimedia technology, and to assess the implications of multimedia technology on training practices in Lebanon. A questionnaire was developed to collect data about training practices, multimedia applications and multimedia based training. The survey reflected the current state of training in Lebanon, and the degree to which the Lebanese people are familiar with multimedia technology. However, my research had a limitation of finding no data about multimedia based training in Lebanon as multimedia is not yet used in the training field. Thus, this work turned into an exploratory research, and the data revealed from an interview conducted with Dr. Ali Hejase, was used to fill the gap and to explore the future potentials of multimedia in training.

B. Research Findings.

- Training.

One fact revealed by the research is that training is gaining more attention worldwide as a constructive step in building skilled employees. Training is benefiting from new technologies that are used to make this function more efficient.

In Lebanon, the majority of employees do not attend any kind of vocational training. Training as a function is found in the major companies of Lebanon, yet, this function is still underdeveloped and not fully exploited. Training is used to acquaint new employees to their work. However, training is not merely a learning process, it is also a mean of development and improvement. The type of training delivered in Lebanon does not take into consideration these aspects. Training in Lebanon can be described as one that is done in the company by company executives for one (or few) employee(s) as this employee joins work. The use of computers in training is gaining more importance and is part of most training programs. Training programs should develop to provide more benefits for the trainee and the company itself.

- Multimedia :

Multimedia is the new musketeer in the computer world. It has combined for the first time text, graphics, sound and live video all in an integrated environment. Multimedia applications entered various fields like education, training, communications, industry, experimenting, etc. Its uses are expected to grow further to enter fields like medicine and engineering.

Multimedia technology is a new comer to the Lebanese market. It is still unknown to the majority of the Lebanese people. Those who heard about it relate it to computers without having clear perception of what it really is. Multimedia has been introduced in a limited scale into the field of education, thanks to the efforts of some pioneer schools and institutions. The few people who have used multimedia found it a pleasant experience and favor its use in more fields. Multimedia technology still has a long road to go, and it currently brings to memory the first days of computers.

- Multimedia in Training.

Training is one of the fields that multimedia has lately entered. Some pioneer companies striving for modernization have used company-tailored multimedia applications to train its employees. The results were satisfactory and encouraging for other companies to include multimedia in developing their training practices.

In Lebanon, multimedia is not yet part of training programs. However, it is expected that in few years some form of training will be done by the assistance of multimedia applications. An encouraging step is the use of multimedia in some education programs of some schools. Both fields, education and training, are closely related and a success in one foretells a success in the other.

C. Recommendations for Future Research.

If any future research is to be done about multimedia based training, it is advisable that it takes place after multimedia is in use for at least one year in training. This will allow the researcher to collect significant data from primary sources using questionnaires and interviews. The researcher can ask his respondents to rate in scale the importance and effect of each of the characteristics that are related to the use of multimedia in

training (such as those included in the second format of this research questionnaire). Then, the researcher can run some statistical analysis tools to identify the factors that make trainees favor the use of multimedia, and the factors that make ordinary training more favorable. The outcome of the research would determine whether respondents prefer multimedia training or ordinary training. The matter may not be clear cut. Infact it might be revealed that multimedia based training is superior in certain fields, and ordinary training better in other ones. To find exact answers, even more time is needed so that multimedia based training enters all fields and enough information could be gathered about each.

D. Concluding Remark

It is of great importance for companies striving to compete and dominate in their respective fields, to prepare their human resources in the best possible way. Training is a central building block in employee preparation. Any new technology that may assist in developing better training programs is worth trying.

Multimedia is a technology that is used in training in the United States and Europe, giving very rewarding results. The benefits range from reduction in the training time and costs to

better employee motivation and increased efficiency. In Lebanon, companies should be triggered to use multimedia based training so that they can experience these benefits themselves. It needs some courage and a will to change and develop to take the very first step, but after all this is what business is all about.

APPENDECES

Appendix I

Questionnaire Format 1

This questionnaire is part of a graduate research that seeks to provide information about the training programs in Lebanon, and to assess the impact of multimedia on these programs. You are kindly asked to answer the following questions to the best of your knowledge.

1- Age: _____

2- Sex: _____ Male _____ Female

3- Education:

_____ Graduate (Ph.D., Ms, MA) _____ Undergraduate (BS, BA)

_____ Technical school _____ Others

Training

4- Did you attend any training programs?

_____ Yes _____ No

* If you didn't attend any training program please go to question no. 12.

* If you attended more than one training program, please answer questions 5 to 11 based on the last training program attended.

5- Where did you attend this training program?

_____ At the Company I work for.

_____ At a special institute;

Name: _____

6- How long did the training program extend?

_____ Less than 30 days _____ 30 days-90 days

_____ More than 90 days

Multimedia

13- According to your information, what is multimedia?

- A kind of computers. A software.
 A technology. I don't know.
 Other; Determine _____

14- Have you used multimedia?

- Yes No

*** If No, Please Stop Here and Thank you.**

15- Where did you encounter multimedia?

- At work. At training program in a specialized institute
 Other, Determine _____

16- In case you encountered multimedia at a training program, how do you rate multimedia in that program? (Circle a no.)

Not useful at all Annoying Indifferent Useful Extremely useful
/-----/-----/-----/-----/
1 2 3 4 5

17- In what field did you use Multimedia?

- Business field. (Communication, Business information, etc.)
 Education/Learning.
 Entertainment (games, music)
 Other, Determine _____

18- Please check three (3) characteristics you believe are associated most with multimedia.

Easiness and simplicity

Complication

Comprehensiveness

Time consuming

Efficiency

Requires specialized training

19- Are you in favor of use of multimedia in general?

Yes

No

Thanks you very much for your time and effort.

Appendix II
Questionnaire Format 2

This questionnaire is part of a graduate research that seeks to provide information about the use of Multimedia in training programs and assess the impact of multimedia on these programs. You are kindly asked to answer the following questions to the best of your knowledge.

1- Age: ___

2- Sex: ___ Male ___ Female

3- Educational level:

 ___ Ph.D., Ms, MA, MBA.

 ___ BS, BA., BBA.

 ___ Technical school

 ___ Others _____

4- *Why did you attend this training programs?*

 ___ The company I work for requested this.

 ___ I felt the need for it.

 ___ Other _____

6- *How long did the training program extend?*

 ___ Less than 30 days

 ___ 30 days-90 days

 ___ More than 90 days

7- *How many persons attended the training program?*

 ___ Less than 10 persons

 ___ 10 to 25 persons

 ___ More than 25 persons

8- *Have you heard about Multimedia before you attended this training program?*

 ___ Yes

 ___ No

9- Have you used Multimedia before you attended this training program?

___ Yes ___ No

In the following questions please use the scale below for answering

1	2	3	4	5
//-----//-----//-----//-----//				
Strongly agree	Agree	Neutral	Disagree	Strongly disagree

10- Before I used M.M. I was afraid of it. -----

11- Before I used M.M. I was enthusiastic to use it. -----

12- The use of M.M. is time effecient. -----

13- The use of M.M. is comprehensive (provides good understanding of the material). -----

14- The use of M.M. requires previous skills. -----

15- The use of M.M. is Complicated. -----

16- M.M. provides immediate feedback. -----

17- Training using M.M. is joyful. -----

18- Training using M.M. is tiresome. -----

19- Training using M.M. is effective. -----

20- In my opinion, training programs using M.M. are better than traditional training programs. -----

21- In my opinion, M.M. should be used more widely in all fields. -----

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