

UNIVERSITY OF NAIROBI

DEPARTMENT OF EXTERNAL STUDIES

**THE ROLE OF INFORMATION TECHNOLOGY
INSTITUTIONS IN ORGANIZATIONS' GROWTH AND
DEVELOPMENT THROUGH TRAINING:
*A CASE STUDY OF INSTITUTE OF ADVANCED TECHNOLOGY***

UNIVERSITY OF NAIROBI
EAST AFRICANA COLLECTION

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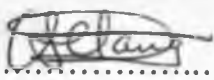
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**A RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE POST-
GRADUATE DIPLOMA IN HUMAN RESOURCE
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DECLARATION

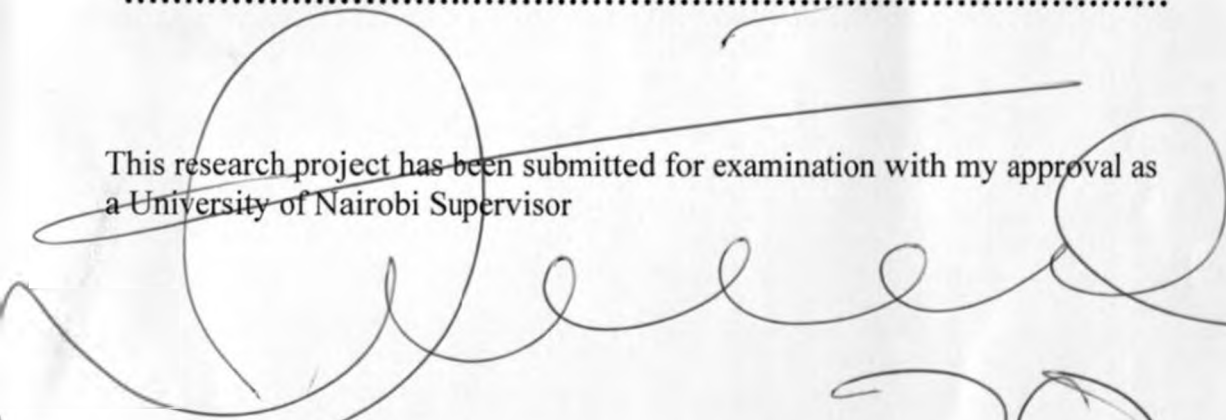
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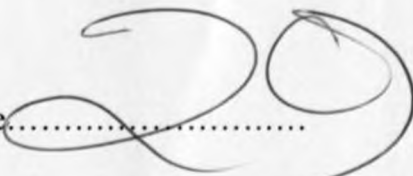
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Date..... 22/5/09.....

Stella Chelangat

.....
This research project has been submitted for examination with my approval as
a University of Nairobi Supervisor


Signed.....

Date..... 

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DEDICATION

**TO MY WONDERFUL DAUGHTERS: CHRYSTE, CHANTELLE
AND CHLOE.**

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This research paper would not have been complete without the input of the following people who gave their support and encouragement to ensure that the project was completed.

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LIST OF ABBREVIATIONS/ACRONYMS

ICT	-	Information Communication technology
IT	-	Information Technology
IAT	-	Institute of Advanced Technology
CD-ROM	-	Compact Disc- Read Only Memory
R&D	-	Research and Development
ICIPE	-	International Centre for Insect Physiology and Ecology
SME	-	Small to Medium Enterprises
PLATO	-	Programmed Logic for Automatic-Teaching Operations
HR	-	Human Resources
ASTD	-	American Society of Training and Development
HRD	-	Human Resource Development
NEO	-	New Employee orientation
AIA	-	American International Assurance
ROI	-	Return on Investment

ABSTRACT

The main purpose of the study was to identify the role of IT institutions in the growth and development of organizations. It seeks to clarify the differences between the government and private organizations in terms of their adoption of IT related skills and training their employees to this end. More private companies were found to embrace training of their employees as compared to the government institutions. Productivity and job retention was found to be higher in the private sector due to the skills that are assimilated while working. Factors such as modernization, globalization and use of internet were found to contribute to a larger extent in compelling institutions to move from manual to computerized systems at work places

The government is called upon to review the ICYT policies and make the sector more attractive to all especially in schools and colleges. This will improve the literacy levels tremendously.

CHAPTER ONE

1.0 INTRODUCTION

This research paper aims to highlight the impact of training in organizations. Of particular interest is the IT training college, Institute of Advanced Technology.

Training is one aspect of any successful organizations. Though not a very old concept, training is fast gaining importance as the company directors recognize and understand the impact of a changing working environment and technology.

The Institute of Advanced Technology is one organization which cannot afford not to train its employees as its core businesses subject to dynamic changes. This requires continued and consistent training of the staff to ensure that the quality of its operations is maintained. Information Technology has seen major changes in the recent past. Since being computer literate is now mandatory for any field of career, training organizations have to keep up with new updates so as to meet the ever changing needs of the clients.

1.1 BACKGROUND OF STUDY

Some Background Facts

The technology in the workplace is changing very rapidly and companies that can't keep up will drop out of competition. A survey by the Ontario (Canada) Skills Development Office found 63% of the respondents planned to "introduce new technology into the workplace that would require staff training." A third of the respondents included "improving employee job performance" and "keeping the best employees" as desired outcomes.

The American Society for Training and Development (ASTD) reports that less than \$1500 per employee was spent for training in 1996. The largest part of that (49 percent) was spent for technical and professional training. Only two percent was spent for New Employee Orientation and three percent on quality, competition and business practices training.

Institute of Advanced Technology was established in 1991. Then, there was only one branch at Emperor Plaza. The college then expanded and has grown to be the leading computer-training organization in East and Central Africa. A Microsoft Certified Computer training institute, IAT is the largest computer training organization in Kenya.

In addition, IAT has earned the honor of being the best Microsoft Certified Technical Education Centre in West, East and Central Africa for four years running. It is the only computer-training center to be ISO 9001 certified.

Every year, students get quality training in the college and sit for international exams. Compared with students from the other colleges, students of IAT excel in these exams.

It is with background that the issue of training of staff members in the organization takes the bulk of time and money to ensure that the output meets the ISO requirements. The institution prides itself with opportunities to train students from both private and public organizations. A good example is the E- Government initiative that saw two hundred police officers trained and graduate at the Institute.

1.2 STATEMENT OF PROBLEM

It is not just enough to hire qualified people into an organization. There is a further need to ensure that the same employees are trained so that they can perform to their best and that the organization meets its goals and objectives. In addition, the employees will meet their needs of having satisfying jobs.

Most turnovers in organizations are precipitated by lack of the necessary skills to perform specific tasks. The employees tend to feel incompetent and may start exhibiting qualities like absenteeism, lateness, more accidents at work place and general loss of morale as far as work is concerned.

Research has shown that one way of dealing with such a problem is to train the employees from time to time. This boosts their morale and hence their output will increase. This is because they will have job satisfaction and confidence to handle their daily work.

Training therefore should be undertaken in all the organizations. This will entail assessing the training needs of the present employees and coming up with training initiatives to meet them.

1.3 OBJECTIVES OF THE STUDY

1. To highlight the importance of training to an organization
2. To assess the training needs prevalent in organizations.
3. To understand the impact of proper and timely training of employees on their job performance.
4. To highlight the cost of lack of training for organization

1.4 RESEARCH QUESTIONS

1. What is the relationship between training of employees and the quality of work done?
2. What is the cost of non-training to organizations?
3. What is the relationship between the dynamic business environment and training opportunities implemented by organizations?
4. What role does training play on the stability of organizations?
5. Are there any significant differences in training of the genders and the kind of organizations in question?

1.5 RESEARCH HYPOTHESIS

- a) There is a relationship between training of employees and the quality of work they do.
- b) Competence in one's field comes from the necessary skills being imparted to the employee.
- c) Organizations, which invest more in training, are likely to retain its workforce for longer.
- d) As many females as males are undertaking training in their various fields of work.
- e) More private organizations undertake any form of training as compared to Government institutions.
- f) There is a linkage between information technology (IT) and firm performance

1.6 PURPOSE OF THE STUDY

This study aims to show the importance of training needs assessments for organizations and how it impacts on its operations.

The human resource department in any organization should not only aim to have thorough recruitment methods, but should also ensure that the employees are trained for retention. Training policies are necessary for the survival of the organizations as the work environment is turbulent. There are many changes and those organizations which have an internal fit will be better off placed to survive. Thus training should form an integral part of the culture and not an adhoc activity carried out when there is no other alternative.

Training should be relevant for those undertaking it and should focus on improving the existing employee skills.

Organizations that have embraced the spirit of training its manpower have continued to soar high in their productivity, innovation and their expansions. The private sector seemed to have grasped this truth faster than the government side which is slowly coming to terms with this truth. It is not uncommon now to find government officials and civil servants undertaking classes to skill up: this is true of the older generation, who you will meet trying to juggle work and evening classes.

This goes to show that gone are the days when workers just sat behind desks and felt bored throughout the day. Managers are now carrying appraisals for their staff and that puts training in the centre of the organizations.

The cost of not training at all is too heavy to be ignored. In the long run companies which see the need to train save more as they are capable of realizing higher productivity and embracing change in the industry. On the contrary, those which have no training initiatives have made huge losses.

1.7 SIGNIFICANCE OF THE STUDY

This research will lay the importance of training for every organization, whether small or big.

In addressing the needs of training, a significant component of the organizations is being highlighted. Many organizations do not undertake any form of training as they fear the costs involved and the fact that time is also wasted.

They do not realize that once trained, employee output increases and so the time used to train is actually well invested.

To cope with the changes in the environment, employers have to empower their workforce through training. This not only benefits the employees but to a large extent, the company as they can withstand the changes. A “bright Organization” is always looking for ways to improve, change or adapt new methods and ways of doing things. This will mean new ideas coming in and better or newer skills being required to accomplish these changes. A wise firm will always prepare its employees through training. When this fails to happen, low or non profitability, employee turnover, lack of job satisfaction and burnout results. This paper will be useful in highlighting these issues and showing the significant role that training plays.

From this paper most organizations will get an eye opener for the role that training plays. Organizations spend a lot on marketing themselves and their products but then end up doing poorly when it comes to the delivery of these services. This is because the manpower is long rusted with old skills which do not match the current modes of production.

In conclusion, this paper will point the way in which productive organizations should position themselves as they better the manpower existing and embracing Technological changes.

This paper reviews and extends recent scholarly and popular literature to provide a broad overview of how information technology (IT) impacts organizational characteristics and outcomes. First, based on a review of the literature, we describe two of the principal performance enhancing benefits of IT: information efficiencies and information synergies, and identify five main organizational outcomes of the application of IT that embody these benefits. We then discuss the role that IT plays in moderating the relationship between organizational characteristics including structure, size, learning, culture, and inter-organizational relationships and the most strategic outcomes, organizational efficiency and innovation. Throughout we discuss the limitations and possible negative consequences of the use of IT and close by considering several key areas for future research.

1.8 LIMITATIONS OF THE STUDY

Since this is a case study, the data collected may not be representative of the other organizations.

Time duration to carry out the research is limited bearing in mind that those who are to be interviews are employees of IAT. In addition, those who filled the questioners were students at IAT, and their learning duration was specific. This meant that questionnaires had to be designed, distributed and collected within a short time.

It was also assumed that corporate students were available whenever interviews would be carried out or questionnaires filled. This was not the case as different organizations send students for training at such times as suits them.

1.9 DELIMITATION OF THE STUDY

The organization has four centers in Nairobi. To avoid biased data, questionnaires were distributed to all the centres in Nairobi. This served to give the required data from the various students studying for different packages.

Available company record on training policies were analyzed critically to establish how training fits within the organization and how it's carried out.

To overcome the problem of time, interviews for the top management were conducted so as to have a feel of the results training has had for the organizations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

A review of literature indicates that training programs are often prescribed as the drug of choice to problem situations in organizations. How often have you heard, "We've got a training problem..." or "They're not doing it the way they're supposed to..."? Often these statements are only *symptoms* of a problem. Until the problem is understood in greater detail, proposing a solution or an intervention can be a costly and fruitless endeavor. Often overlooked as the first step in the performance improvement process is the training needs assessment. A *need* is not a want or desire. It is a gap between "what is" and "what ought to be". The needs assessment serves to identify the gaps, and considers if the problem can be solved by training. The assessment is part of a planning process focusing on identifying and solving performance problems.

Why Conduct a Training Needs Assessment?

- To determine what training is relevant to your employees' jobs,
- To determine what training will improve performance,
- To determine if training will make a difference,
- To distinguish training needs from organizational problems, and
- To link improved job performance with the organization's goals and bottom line.

In reading different articles and books, you will come across the words *need assessment* and *need analysis*. The terms are interchangeable, but they have the same meaning and purpose, to assess and analyze. The primary purpose of the training needs assessment - analysis process is to ensure that there is a need for training and to identify the nature of the content of the training program. Conducting an assessment is a way to collect information that can be used to decide what type of development will be perceived as relevant and useful. An assessment enables a conversation to take place that questions what skills and knowledge is required to be more effective. It is important that we view training or performance improvement efforts as a "system" not a "silo". Our efforts to improve one part of the organizational system will affect other jobs in the workplace environment. The needs assessment process is an important first step in the development of a training program or performance improvement initiatives.

A needs assessment provides an opportunity to consult with a variety of people in the organization. The information collected, ideas generated, and the conversations that take place when people discuss their work lives lend enthusiasm to the process. The data collected - whether obtained through interviews, observations, focus groups, performance data, questionnaires or tests - can clarify issues and provide a focus on performance.

2.1 The Role of Technology in Quality Education

According to G. David Garson, Quality education is a universal goal. It is common to hear arguments that instructional technology will be the key to educational quality as we enter the new millenium (cf. Fiske and Hammond, 1997). Investment in educational technology

is urged upon policy-makers as the path to educational quality (Mergendollar, 1996). In fact, enthusiasts for educational technology argue that quality has and will continue to increase rapidly, creating a "new educational culture" (Connick, 1997). Whatever problems exist are seen as ones which can be handled through better administrative and technological planning - that is, technology believers perceive no intrinsic obstacles to total quality assurance using information technology in higher education (ex., Roth and Sanders, 1996).

Other voices question educational technology as a panacea. Cardenas (1998), for instance, has written on the problems associated with technology in the college classroom in terms of issues such as poorly functioning equipment, over-promotion of technology-based learning to students, and lack of quality in courses delivered by technology.

2.2 Information Technology Landscape in Kenya

ANALYSIS: NATIONAL IT STRENGTHS AND WEAKNESSES

Overview

There are many reasons why the development of Information Technology is slow. For instance, the connectivity problems is as a result of unusual socio-economic conditions in the country. Other reasons include poor economy, high foreign debt, alarming population growth, declining resources and social infrastructure, and degradation of the environment. These problems have direct impact on the implementation of the network and the kind of public policies that promote connectivity.

It is my hope that with the new governance some of the weaknesses will be eliminated.

The only way to improve IT in Kenya is by:

- ☐ **Improving connectivity**
- ☐ **Increasing Internet access**
- ☐ **Lowering costs of hardware and software, and connectivity**
- ☐ **Encouraging research and development on technology**
- ☐ **Developing IT skills**
- ☐ **Assessing and increasing e-commerce readiness and use**

IT STRENGTHS

Kenya is a relatively stable country. This is vital in any country that is trying to advance.

- ☐ **The privatized Telkom Kenya which is the sole provider of basic telecommunication services.**
- ☐ **Internet use is growing rapidly. Kenya has one of the largest Internet sectors in Africa, with over 30 licensed ISPs. The Internet is available in Universities, Internet Cafes, community information centers, public libraries, etc**
- ☐ **Electronic commerce has made progress in the tourism industry.**

IT WEAKNESSES

- ❑ Lack of good information on connectivity.
- ❑ Poor Telecommunication Infrastructure. Kenya's telecommunications sector suffers from under-investment and political interference. It is unreliable
- ❑ Kenya has not formulated integrated national informatics policies.
- ❑ Unreliable electric power.
- ❑ Lack of research and development on technology.
- ❑ Lack of trained professionals in IT.
- ❑ Cost of internet are high.

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Needs Assessment Methods: *Scenarios*

The format a needs assessment can take can vary. Generally, an assessment is conducted as a survey. However, you may develop questions and conduct individual interviews or focus groups. Or, you can collect and analyze performance data to determine common needs. We will explore these areas through the use of personal observations; additional assessments may include on-site observation, testing and assessment centers. On-site observations should be conducted by individuals who are experienced and knowledgeable with regard to performing a *task analysis* of the work processes, procedures, methods, and practices being observed. These individuals are referred to as subject matter experts (SME's) and they can be found both inside and outside the organization. Typically, SME's are individuals who once worked in the position and have the in-depth knowledge of the concepts, and processes. Subject matter experts offer the troubleshooting information you may need to determine whether additional training is needed, whether the situation is indicative of a

needed intervention. If you plan to use testing and assessment centers, or both, you will want to check into validation and reliability studies to ensure compliance with legal requirements.

Scenario Three - Data Gathering

With the continuing emphasis on competency development, companies are seeking individuals who consistently meet or exceed performance requirements and organizational goals. In turn, more and more companies are turning to 360-degree feedback, also referred to as multi-rater assessments (MRA), and to testing or assessment centers. These tools play a key part in a training need assessment from the standpoint of a continuous improvement process!

The first source of acquiring assessment information is to define the abilities desired of managers - competencies, knowledge, skills, tasks, behaviors and actions. This has been the function of job analysis, and the resulting job descriptions. As companies continue to go through change, these analyses and descriptions require continuous updating. However, these descriptions become the basis for evaluating levels of competence, which can help HR practitioners, assess needs for training and development programs. These descriptions are one source of assessment information.

A second source of assessment information has been performance evaluation data. The purpose of evaluation was to help individuals to enhance those areas needing improvement. The difficult task of assessing how well people are doing their jobs has traditionally fallen to supervisors and managers, even though they are usually not in the best position to observe employee performance on a regular basis. More companies are turning to MRAs or 360-degree feedbacks. This technological evolution has a profound

implication. *Managers now have a tool for separating the evaluation of abilities for developmental purposes from the evaluation of performance results!* MRA's involve identifying key direct reports (such as peers, internal customers, the employee's manager, subordinates, and the employee's manager's manager) to participate in a performance evaluation. An MRA is an assessment tool that involves each employee in developing a performance enhancement plan. From this information, companies can identify potential training programs and can track and evaluate progress.

A third source of information may be for the company to use a managerial evaluation or assessment center to develop individuals in career pathing or a succession planning process. There are tests and assessment center processes that assess skills, aptitudes and behaviors for specific jobs. Through administration, the company would then receive objective feedback on which candidates currently possess characteristics, or on certain developmental areas necessary for candidates in a career path or succession plan. Some of the typical functions assessed for managerial level candidates include setting organizational objectives, managing budgets, improving work procedures, coordinating interdepartmental work activities, developing teamwork, and making decisions.

A fourth source of information is the identification of exemplary performers who are meeting and exceeding performance criteria. The information gained through the use of interviews can be utilized to evaluate career pathing and succession planning and to improve the development of the workforce. In an assignment with a major restaurant chain, our interviews focused on three areas: (1) the current position and what skills and experiences prepared employees for success; (2) the challenges of the current position and what knowledge, skills or experiences would have helped prepare employees; and (3) the

impact (if any) that employees feel organizational changes have or will have on the work they do.

Obviously, when you consider implementing a training program, assessment work is mandatory. A great deal of information is required before you can move forward with a performance improvement effort designed for organizational impact. The HR professional plays a key role in contributing to performance effectiveness within the organization.

We are pleased to announce that "*Conducting a Training Needs Assessment*" is published in the book "Effective Human Resource Measurement Techniques" and is available through the Society for Human Resource Management.

2.3 "GAP" ANALYSIS.

The first step is to check the actual performance of our organizations and our people against existing standards, or to set new standards. There are two parts to this:

- *Current situation:* We must determine the current state of skills, knowledge, and abilities of our current and/or future employees. This analysis also should examine our organizational goals, climate, and internal and external constraints.
- *Desired or necessary situation:* We must identify the desired or necessary conditions for organizational and personal success. This analysis focuses on the necessary job tasks/standards, as well as the skills, knowledge, and abilities needed to accomplish these successfully. It is important that we identify the critical tasks necessary, and not just observe our current practices. We also must distinguish our actual needs from our perceived needs, our wants.

The difference the "gap" between the current and the necessary will identify our needs, purposes, and objectives.

What are we looking for? Here are some questions to ask, to determine where HRD may be useful in providing solutions: (3)

- *Problems or deficits.* Are there problems in the organization which might be solved by training or other HRD activities?
- *Impending change.* Are there problems which do not currently exist but are foreseen due to changes, such as new processes and equipment, outside competition, and/or changes in staffing?
- *Opportunities.* Could we gain a competitive edge by taking advantage of new technologies, training programs, consultants or suppliers?
- *Strengths.* How can we take advantage of our organizational strengths, as opposed to reacting to our weaknesses? Are there opportunities to apply HRD to these areas?
- *New directions.* Could we take a proactive approach, applying HRD to move our organizations to new levels of performance? For example, could team building and related activities help improve our productivity?

Mandated training. Are there internal or external forces dictating that training and/or organization development will take place? Are there policies or management decisions which might dictate the implementation of some program? Are there governmental

- *Cost-effectiveness:* How does the cost of the problem compare to the cost of implementing a solution? In other words, we perform a cost-benefit analysis.

- *Legal mandates:* Are there laws requiring a solution? (For example, safety or regulatory compliance.)
- *Executive pressure:* Does top management expect a solution?
- *Population:* Are many people or key people involved?
- *Customers:* What influence is generated by customer specifications and expectations?

If some of our needs are of relatively low importance, we would do better to devote our energies to addressing other human performance problems with greater impact and greater value.

Step 3. IDENTIFY CAUSES OF PERFORMANCE PROBLEMS AND/OR OPPORTUNITIES.

Now that we have prioritized and focused on critical organizational and personal needs, we will next identify specific problem areas and opportunities in our organization. We must know what our performance requirements are, if appropriate solutions are to be applied. We should ask two questions for every identified need: (6)

- Are our people doing their jobs effectively?
- Do they know how to do their jobs?

This will require detailed investigation and analysis of our people, their jobs, and our organizations -- both for the current situation and in preparation for the future.

Step 4. IDENTIFY POSSIBLE SOLUTIONS AND GROWTH.

- Training may be the solution, IF there is a knowledge problem.
- Organization development activities may provide solutions when the problem is not based on a lack of knowledge and is primarily associated with systematic change. These interventions might include strategic planning, organization restructuring, performance management and/or effective team building.

2.4 Overall Training Expenditures

Overall, employers spent an average of \$627 per employee on training in 1998. Training expenditures per employee were highest among respondents in the United States (\$724 per employee) and lowest in Asia (\$241 per employee).

Comparing 1997 with 1998, the United States and Canada both experienced increases in training expenditures per employee (11 percent and 18 percent, respectively), while Japan and Europe showed decreases (7 percent and 32 percent, respectively). This increase in the United States and decrease in Europe enabled the United States to overtake Europe as the leader in expenditures. Canada edged closer to Europe, but remains number three in overall expenditures per employee. Because Asia, Australia, and New Zealand were combined into a single region called "Asia/Pacific" for last year's report, comparisons over time could not be made. Separating Asia from Australia/New Zealand revealed that the former had the lowest level of expenditures, replacing Japan, which had the lowest amount the previous year.

A country's level of development also appeared to translate into differences in the level of spending on training in 1998. Countries classified as high on the HDI had training expenditures per employee of \$684 compared with a much lower amount of \$252 per employee in HDI medium countries. When calculated as a percentage of payroll, training

expenditures per employee were highest in Europe (3.2 percent of payroll) and lowest in Japan (1.2 percent). Europe was the only region with expenditures greater than 3 percent. All of the regions experienced increases in training expenditures as a percentage of payroll from 1997 to 1998. The largest increase was seen in Canada, where expenditures increased from 1.5 percent in 1997 to 2.3 percent in 1998.

As for projected changes from 1998 to 1999, the largest increase was reported in Australia/New Zealand, where a 26 percent increase in total training expenditures was anticipated - a full 11 percentage points more than the next highest region, which was Europe with 15 percent. The previous year, Japanese firms responding to the Measurement Kit projected a 5 percent increase, the lowest among all of the regions. Growth projections for 1999 for Japanese respondents increased to 12 percent. The increase in Japan resulted in Canada having the lowest projected percent change in expenditures for 1999 (9 percent). Compared with growth projections for 1997 to 1998, the estimates decreased by 6 percentage points in the United States from 20 percent in 1998 to 14 percent for 1999.

Looking across regions, ASTD identified a number of factors associated with how much organizations spend on training. For example, in every region except Canada, organizations with higher expenditures per employee tended to have relatively fewer employees for every training staff member. In Europe, Japan, and the United States, spending on training per employee increased with the percentage of employees trained. In Europe, Canada, and the United States, the level of training expenditures as a percentage of payroll increased with the hours of training provided per training-eligible employee.

Other factors associated with training expenditures varied by region and include the following:

- In Asia, firms that rely more heavily on learning technologies spent more per employee on training. Also, Asian firms that employed innovative training practices spent more on training measured as a percentage of payroll.
- In Europe, firms that used more high performance work practices spent more on training as a percentage of payroll.
- In Canada, organizations with more employees were likely to spend less than smaller organizations.
- In Japan, firms with heavier use of learning technologies and innovative training practices had especially high training expenditures as a percentage of payroll.
- Higher spending by firms in the United States (both per employee and as a percentage of payroll) was associated with the use of more innovative training and compensation practices as well as high performance work practices.

Employees Trained

Respondents in Australia/New Zealand led the way in the percent age of workers receiving training in 1998, reporting a training level of 77 percent of employees. The United States, Europe, and Canada were close behind with a range of 70 to 76 percent of employees. Respondents in Japan provided training to the smallest percentage of employees (45 percent).

Compared with 1997, the United States and Canada reported slight increases in the average percentage of employees receiving training (1.5 percent increase in each).

Europe experienced a slight decrease (2.4 percent) in the percentage of employees receiving training, while Japan remained unchanged at 44.9 percent.

Japan had the highest average employee-to-trainer ratio among the regions (914 employees per trainer), even in light of a large decrease of 46 percent from 1706 employees per trainer in 1997. Australia/New Zealand had the lowest employee-to-trainer ratio (252:1). Firms classified as high on the HDI had 371 employees per trainer, whereas those categorized as medium had substantially fewer employees per trainer (269:1). All of the regions except Europe decreased from 1997 to 1998. Europe increased from 305 to 354 employees per trainer.

Looking ahead, respondents in every region expected an increase in the percentage of employees receiving training in 1999, with the projections ranging from a 1.6 percentage point increase projected in Japan to an 8.5 percentage point increase in Asia. By 1998, respondents in the United States anticipated providing training to 82 percent of employees. In actuality they provided training to 76 percent and once again set target projections at 82 percent of employees for 1999. The highest level of projected percentage of employees receiving training was Australia/New Zealand (84 percent of employees). In contrast, respondents in Japan expected that still less than half (46.5 percent) of employees would receive formal training in 1999.

Training Hours

Respondents in Europe reported providing the highest number of total hours of training per employee (49 hours per eligible employee).⁸ The variation among the other five regions fell in a relatively narrow range of 26 hours of training per employee in Asia to 33 hours per employee in Canada. There was only a slight difference between high- and medium-developed countries.

Training as a culture

Many companies provide some sort of introductory training or orientation for most of their new employees. It may take the form of an older employee assigned to show the new employee "the ropes." Or it may be left to the HR department or the individual's new supervisor to show them where the coffee pot is and how to apply for time off.

Many organizations, especially in government and academia, have created new employee training that is designed, exclusively or primarily, to provide mandated safety familiarization.

Yet some companies in highly competitive industries recognize the value in New Employee Orientation (NEO) that goes much farther. They require several weeks or even months of training to familiarize every new employee with the company, its products, its culture and policies, even its competition.

There is a measurable cost to that training, but is it worth it? Let's look at some of the issues.

Reasons To Not Do New Employee Training

Even at the less than \$1500 per year for training an employee we reported above, it is still a cost. For some companies, especially those with traditionally high turnover, it can be a major expense. If your profit per employee is less than \$1500, it would be difficult to convince the stakeholders that training is justified. Besides, we all know it is the responsibility of the school system to train people to be workers. And it is the worker's responsibility to learn how to do a job so they can get hired.

Why Do New Employee Training

Not surprisingly, all the reasons not to train new employees (except cost itself) are actually reasons to do that training. If you have high turnover, training new employees will make them more productive. They will feel better about themselves and the job. They will stick around longer.

If your profit per employee is less than \$1500 per year, you have major problems. You need to start training all your employees, not just your new employees, right away. Show your stakeholders the potential ROI of the training as we will discuss below.

And if you still believe that our schools provide adequate training to make students labor-ready you are living in a dream world. Yes, some job seekers make the effort to learn on their own the skills needed for a new job, but most get that training on the job.

Required Training

Government regulation, insurance coverages, and common sense dictate some training that **MUST** be given to every new employee.

Other Reasons for New Employee Training

American International Assurance is an ISO 9002 certified insurance company. AIA makes a commitment to training for their staff because AIA "recognizes that the training and development knowledge, attitude and skills of the staff and agency field force are fundamental to its continued efficient and profitable performance."

Orchard Supply Hardware considers its New Employee Training program important enough to include in their list of benefits for full and part-time employees.

An Interesting Proposal

Dr. Edward Gordon recommends companies make training a stand-alone function, separate from HR. He points out a twenty percent increase in training expenditure since 1983 has not kept pace with the twenty-four percent increase in workers in the same period. He suggests Training Managers use Return on Investment (ROI) to demonstrate that the training function is a profit center, not just a cost center.

Summary

In Dr. Gordon's article cited above, he points out that companies such as Sprint, Xerox, General Electric and General Motors have opted to establish Corporate Universities, reflecting the importance they place on employee training.

The value for smaller companies is arguably even greater. And there is no better time to start employee training than New Employee Orientation.

Many entrepreneurs seem to view employee training and development as more optional than essential...a viewpoint that can be costly to both short-term profits and long-term progress.

The primary reason training is considered optional by so many business owners is because it's viewed more as an expense than an investment. This is completely understandable when you realize that in many companies, training and development aren't focused on producing a targeted result for the business. As a result, business owners frequently send their people to training courses that seem right and sound good without knowing what to expect in return. But without measurable results, it's almost impossible to view training as anything more than an expense.

Now contrast that approach to one where training's viewed as a capital investment with thoughtful consideration as to how you're going to obtain an acceptable rate of return on your investment. And a good place to start your "thoughtful consideration" is with a needs analysis.

As it relates to training and development, a needs analysis is really an outcome analysis-- what do you want out of this training? Ask yourself, "What's going to change in my business or in the behavior or performance of my employees as a result of this training that's going to help my company?" Be forewarned: This exercise requires you to take time to think it through and focus more on your processes than your products.

As you go through this analysis, consider the strengths and weaknesses in your company and try to identify the deficiencies that, when corrected, represent a potential for upside gain in your business. A common area for improvement in many companies is helping supervisors better manage for performance. Many people are promoted into managerial positions because they're technically good at their jobs, but they aren't trained as managers to help their subordinates achieve peak performance.

Determining your training and development needs based on targeted results is only the beginning. The next step is to establish a learning dynamic for your company.

In today's economy, if your business isn't learning, then you're going to fall behind. And a business learns as its people learn. Your employees are the ones that produce, refine, protect, deliver and manage your products or services every day, year in, year out. With the rapid pace and international reach of the 21st century marketplace, continual learning is critical to your business's continued success.

To create a learning culture in your business, begin by clearly communicating your expectation that employees should take the steps necessary to hone their skills to stay on top of their professions or fields of work. Make sure you support their efforts in this area by supplying the resources they need to accomplish this goal. Second, communicate to your employees the specific training needs and targeted results you've established as a result of your needs analysis.

Third, provide a sound introduction and orientation to your company's culture, including your learning culture, to any new employees you hire. This orientation should introduce employees to your company, and provide them with proper training in the successful procedures your company's developed and learned over time.

Every successful training and development program also includes a component that addresses your current and future leadership needs. At its core, this component must provide for the systematic identification and development of your managers in terms of the leadership style that drives your business and makes it unique and profitable. Have you spent time thoughtfully examining the style of leadership that's most successful in your environment and that you want to promote? What steps are you taking to develop those important leadership traits in your people?

Financial considerations related to training can be perplexing, but in most cases, the true budgetary impact depends on how well you manage the first three components (needs analysis, learning and leadership). If your training is targeted to specific business results, then you're more likely to be happy with what you spend on training. But if the training

budget isn't related to specific outcomes, then money is more likely to be spent on courses that have no positive impact on the company.

In many organizations, training budgets are solely a function of whether the company is enjoying an economic upswing or enduring a downturn. In good times, companies tend to spend money on training that's not significant to the organization, and in bad times, the pendulum swings to the other extreme and training is eliminated altogether. In any economic environment, the training expense should be determined by the targeted business results you want, not other budget-related factors.

To help counter this tendency, sit down and assess your training and development needs once or twice a year to identify your needs and brainstorm how to achieve your desired results effectively and efficiently.

Your employees are your principle business asset. Invest in them thoughtfully and strategically, and you'll reap rewards that pay off now and for years to come.

Leaders understand the importance of providing employees with opportunities to grow personally and professionally. It is critical that the type of training an employer provides meets the needs of the business and its employees.

It is equally important that the impact of training is evaluated. Otherwise, a business may never really know whether or not the training accomplished what was expected. Any training provider or consulting firm worth its salt should be able to assess both the need for specific training as well as demonstrate the intended and actual impact of that training.

Managers from GTT, a small electronics firm based in Plano, began taking a serious look at the company's training needs, but really didn't know where to start. With the help of a Smart Jobs grant, training consultants from the Bill Priest Institute and engineers from the Texas Manufacturing Assistance Center, GTT leaders began looking at internal processes that would reduce the amount of time they spent in rework or fixing products with defects. According to Corky Roberts, senior quality engineering manager, the efforts were somewhat fragmented.

"It was important for us to look at the entire business picture in order to determine where our priorities were," he said. "It would have been easy to just 'throw some training' at people, but we knew that it had to be connected to our vision and mission. And owner Gilbert Trevino needed to be assured that if he pulled employees off the floor that it would absolutely result in long-term benefits."

Roberts said that GTT is now also involved in providing language training to many employees whose English skills are limited.

"This has been a tremendous help to employees both at work and in their personal lives," he said.

Many businesses have a clear understanding of where improvements are needed. It's sometimes difficult to take an objective look at setting priorities, especially when you're in the middle of all of the activity. Addressing priorities and root causes aren't easy tasks;

sometimes outside help is beneficial. Also, accessing the intelligence and expertise of key employees for their ideas, expected solutions and outcomes can help get the decision process moving and build sustaining support for change.

An obstacle that tests every business' fortitude is the amount of time away from work required to train, as well as the time needed to practice and implement new ideas.

Everybody struggles with the age-old quandary, "there's too much work to do already and we'll just get further behind if we have to do training or try different processes!" There must be clear and definite support at the management level -- all the way to the top -- in order to garner support for training and the expected outcomes.

2.5 Workforce Development Trends:
Reflecting the Importance of Continuing Education
and Lifelong Learning

According to the University Continuing Education Association, employers have begun to recognize that money spent on training employees is more realistically an investment rather than a cost. A more skilled workforce results in increased economic productivity. So, organizational spending on workforce education and training is on an upward path.

A workforce with higher skill levels is more productive. Increasingly, education and skills are seen as important determinants of the employ-ability and income potential of the worker. The productivity of labor—the output produced per hour of work—is becoming more and more a function of what the employee knows and can do.

In 1948, men who had finished less than 12 years of formal education completed 60 percent of the hours worked by men. By 1997, this figure had dropped to 12 percent. Women with less than 12 years of formal education accounted for 50 percent of hours worked by women in 1948 and only 9 percent in 1997.

In 1999, the Bureau of Labor Statistics attempted to compute the contribution of increased worker skill to increased productivity. They estimated that in the period 1973-79, increased worker skill accounted for only 2 percent of overall increased productivity. In the period 1990-1997, 32 percent of increased workforce productivity was estimated to be due to increased knowledge and skill. This underscores the changing nature of the U.S. and global economies and stresses the increasing importance of knowledge and skills to economic productivity.

Continuing education helps employers retain employees and stay competitive.

Employers are using opportunities for education and training to attract and retain the best employees. Employers sponsor in-house training as well as underwrite the costs of education away from the workplace. Fifty-five percent of the companies ranked by Fortune Magazine as the "100 Best Companies to Work For" paid for between 21 and 40 hours of training per employee in 2001. Another 34 percent paid for 41 to 80 hours of training, and 8 percent paid for more than 80 hours of training per employee per

year. In addition to training, many companies offer tuition reimbursement, college planning assistance and paid or unpaid sabbaticals.

A variety of other benefits offered to employees can positively affect an employee's ability to pursue continuing education or training. Flex-time, reduced hour employment, telecommuting and onsite childcare can all make the pursuit of higher education more easily attainable for working people.

Training of employees is an investment in two distinct ways. First, a more educated employee tends to be more productive. Second, training can be seen as a way to attract and retain talented employees.

Employers often outsource design and delivery of training. Organizations use a wide variety of sources for training. Traditional colleges and universities are among the most commonly hired to provide training. *Training Magazine* estimates that 40 percent of all training received by employees is designed by outside sources.

Though outsourcing of training expenses remains strong, the proportion of training dollars spent outside any given organization has declined in the past three years. There has been a roughly corresponding increase in spending on wages and salaries of training staff. Cutbacks as a result of the recession forced organizations to curtail outside training expenditures in 2000.

Institutions of higher education are clearly a valuable source of workforce training. Those institutions that are best able to customize their learning products, keep pace with changing technologies, develop training content quickly and provide training on a flexible schedule are the ones most likely to be successful and grow their share of the workforce training market.

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UNIVERSITY OF NAIROBI
EAST AFRICANA COLLECTION

PROSPECTS FOR INFORMATION TECHNOLOGY IN AFRICA I. Introduction

1. Access to information and communications technologies is becoming increasingly critical for African community's participation in economic and political life at national, international and global levels. Advances in electronic communication networks have created enormous opportunities for developing countries. A sizable number of African countries have already made progress in their Internet links that have put them on the global connectivity roadmap.

2. Meanwhile, socio-economic problems continue to cripple equal access to information and communication technologies in African countries. The region continue to suffer from life threatening malnutrition, endemic and epidemic diseases, debilitating ignorance, continuous conflicts and bad performing economies that block the aspiration for increased information access. The resource at the disposal of governments are mostly directed to

dealing with emergencies with little left for long-term investments in sectors that could trigger socio- economic development. Education, information and communication are some of the sectors that need immediate attention for development in Africa.

3. African governments face two challenges in the information and communication field, namely: provision of access for enhanced participation in economic life and coping with the challenges of rapidly advancing technology. What should African countries do to overcome these rather challenges? Which are the central technologies that bring advancement under current socio-economic situation? Is regional information infrastructure a possibility? This paper will focus on the prospects of information technology in Africa in the wake of the information society.

II. Information technology for emerging information society in Africa

4. Development can be seen as an increase of knowledge and skills and creative potentials that can be applied to improve the quality of life. Research shows that low levels of knowledge and inadequate innovative skills at lower, middle and higher levels have contributed to the continuous failures in African countries in all spheres. Information and knowledge are interrelated. Well informed, knowledgeable and innovative citizens are causes for human centered development. Information technology facilitates the flow of knowledge in modern society. The failure to use information technology is becoming as negative as the refusal to attend school. It is a choice between being left out or benefiting from enormous benefits of information technology.

5. A cluster of technologies is responsible for shaping the way modern information society is emerging. The merging of communications and computing technology with printing and

public information using intelligent tools has made the availability of information easier. The advancement did not occur in technology only. A wide variety of information is becoming available through networks for everyone, at anytime, and at any place.

6. The prospects of information technology for Africa are tremendous. Nowadays it is becoming increasingly difficult to run an institution without using computers. Desktop machines are replacing traditional office typewriters. Information technology that can be used, maintained and developed by the indigenous professionals is crucial. Education and training is a key to building indigenous capacity that helps reduce dependence on developed world, to cut under-utilisation of existing equipment and to help to apply technology for solving local complex problems. Though the changes for technology render what is appropriate at one time inadequate at another, African countries should consider effective use of some basic technologies. Four main technologies are very important in information access in developing countries, namely: desktop publishing, CD-ROM, on-line access and Internet connection.

Desktop publishing

7. No other region is more in publishing crisis than Africa. The book famine can be compared to the food shortage in the region. Publishing as well as getting what is published is a nightmare. Libraries in schools and public libraries have continued to decline in holdings of up-to-date books, reports and journals. The revolution in desktop publishing is the most promising rescue to the weak publishing industry in Africa.

8. The availability of word processors, desktop publishing packages and tools, text, multimedia and graphics authoring tools, page description languages and document

exchange standards makes desktop publishing an outstanding device for improved publishing in developing countries. Desktop publishing has made substantial a revolution in the quality and ease of publications. It saves the resources needed to produce a document, and reduce the turn around time in traditional publishing process. It facilitates making last minute changes controls the whole publishing processing from a desktop.

9. Personal computers have made much easier the production of newspapers, magazines, books, retail flyers, cards etc. by individuals. The equipment to manage a desktop station has undergone though a significant transformation since 1986. The cost of a desktop workstation and software in 1986 was over US \$20,000. A powerful desktop workstation can be purchased for less than US\$4,000 today.

10. There are indications of desktop publishing revolution in Africa. For example, the International Centre for Insect Physiology and Ecology (ICIPE) in Kenya has demonstrated how a successful scientific publishing can be built with a minimal investment. A small two person computer company in Eritrea was able to produce the national elementary and high school textbooks for the Ministry of Education. These and other projects have shown that it is not the technology that is a bottleneck to publishing industry in Africa. Rather it is training that becomes critical to achieve better standards in quality of scientific and commercial publishing.

The Borkian Vision of the Future of Education

Alfred Bork is a leading educational technology guru, having for years headed the Association for Computer Machinery's Special Interest Group on Computer Uses in Education and having advised on this subject for the National Institute of Education and

having been named Outstanding Computer Educator by the Association of Educational Data Systems, among other honors. In 1999 Bork was interviewed by Educom Review, the leading association of colleges and universities for the advancement of educational technology. In this interview (Educom Review, 1999), Bork set forth several aspects of his vision of "the future of education:"

1. Education will become highly interactive, engaging the student every 20 seconds or so for a response, much in contrast to present-day passive lecture methods.
2. Education will become highly individualized, with world-accessible records of learning attempts by particular students, to enable computer presentation of education tailored for each student's past learning experiences and styles.
3. Education will become highly flexible in interaction, enabling natural-language tutoring using the Socratic method of tutorial question and student response.
4. Education will become highly accessible, opening opportunities for the disadvantaged in this country as well as for the millions in developing nations.
5. Education will become highly computer-mediated, replacing (not supplementing, which would be an added cost) the lecture method in courses for 15 or more students.

2.6 NATIONAL ICT POLICIES

Overview

Kenya has not formulated integrated national informatics policies. Their policy activities in the recent years indicate an eager awareness of the potential of IT in the development of its' economy. The lack of integrated policies is probably due to the political, legal and technical difficulties of formulating and implementing them. The government is optimistic about setting up national frameworks for IT development by using less difficult approaches. The Government is in the process of formulating and implementing IT sectoral policies, which would evidently bring about increased use of IT in the country. By making use of the existing infrastructures and resources, the Government can move quickly from policy to implementation plan.

Hardware

The Government's sixth development plan (1989-1993) analyzed the IT infrastructures at the time and directed the Government on how to invest in further development. It was intended to support and make it possible to produce hardware and software as well as manpower training.

The government has policies relating to technology acquisition. In the past the main force of such policies has always been the regulation of the importation of computers. Kenya has gone through periods during which the governments activity discouraged the importation of computers on the grounds that they created unemployment. These periods were, however, relatively short-lived. The importation of computers is controlled through import

controls, licensing and foreign exchange rationing. It is not obvious whether these controls are still in place in the era of structural adjustment.

Software

There is no government policy commitment to: promoting the development of the software industries; Training and Education in Software Engineering; Software Standards development; Introduction and promotion of international software houses; Provide and enforce legal protection of privacy and intellectual property of software assets. The main reason could be that there is a lack of manpower and infrastructure, for instance, reliable telecommunication systems. Telecommunication is one of the most vital infrastructures for the development of informatics. Kenya government has put in place a centralized, monumental and monopolistic organizations to establish, maintain and develop telecommunication services.

Data Banks

Kenya has taken policy strides in terms of setting up public data banks for use by policy makers. A number of information bureaus have been set up to store and provide data for planning and decision-making. This data is utilized in the formulation, implementation, monitoring and evaluation of development programmers. These centers include: Central Bureau of Statistics, Government Computer Services Center, District Information and Documentation Center, and the Ministerial Information Centers. The Government also intended to establish a Development Resource Center to develop and maintain databases designed to promote information sharing between government agencies, private institutions, and individuals.

Research and Development (R&D)

The Kenya government has no direct policy relating to R & D in informatics

Science & Technology

The Science and Technology Act (Chapter 250) established the National Council for Science and Technology (NCST) on July 1st 1977. It is a statutory institution. The Council's main focus is on the science and technology policies. Its' function is to advise the Government on all aspects of science and technology, and most important on how to utilize technology to enhance the economy. The Kenya National Council for Science and Technology is directly engaged in formulating and implementing sub-sectoral policies in informatics.

Bork is hardly the only technology spokesperson who believes that computer-mediated distance education will spell the end of the traditional university as we know it. George Mason University's Peter Denning (1997) made such an argument before the National Science Foundation, basing himself on four arguments:

- (1) The library as a physical place is soon to be replaced by digital libraries accessible worldwide by almost anyone.
- (2) The "community of scholars" around the library is soon to be replaced by communities of specialists linked electronically, divorced from geographical location.
- (3) The ideal-typical small undergraduate class has become unaffordable and cannot compete with commercially-provided education on the same subjects, such as computer

science, nor can universities compete with commercial courses' glitz and entertainment production values.

(4) Job structure has changed such that universities can no longer hope to prepare students for or promise them a "lifelong career", the central selling point of higher education until recently.

Denning then asked, "What roles can universities fulfill that people would find valuable?" The answer, Denning argued, was increasingly Internet-based distance education for adult professionals. Similarly, futurists often see an inevitable economic shift from local material goods to global knowledge services, forcing education to move toward electronically-mediated education (cf. Alic, 1997). "A revolution is taking place in education," wrote Donald Norman and James C. Spohrer (1996: 25-6) in *Communications of the ACM*, the nation's premier computing journal. Norman and Spohrer noted that though distance education has been around forever, only in recent years has new technology been available to fuel the hyperbolic growth of the Internet and energized a new vision of how to deliver distance education. Gerald van Dusen, in his *The Virtual Campus: Technology and Reform in Higher Education*, sets forth an optimistic view of how technology will transform education from faculty-centered to learner-centered, making instruction better by replacing the "sage on the stage" with interactive, individualized learning possibilities; will improve scholarly research by enabling far greater collaboration as well as information access; and will improve educational organization by facilitating interdisciplinary connections and encouraging academic "total quality management."

The hope Bork, Denning, van Dusen, and others of this school is that online education will do for the masses in the twenty-first century what the public library movement did in the

nineteenth and the expansion of public universities did in the twentieth. Online education potentially may be disseminated to millions who previously could not have hoped for a college education due to circumstances. With the erosion of job tenure and job security, moreover, the challenge of twenty-first century university education will more and more have to do with dispersed adult learners who must remain at work but retool for career changes. This audience may be reachable primarily and often only through online education.

The Legacy of Programmed Learning

It is trite but true that those who fail to remember the past are condemned to repeat it. In assessing the future of online education, it is easy to forget lessons associated with the relative failure of the programmed education movement of the 1960s and early 1970s. Programmed learning was based on many of the same principles to which Bork and other enthusiasts of educational technology allude: clearly stated behavioral objectives, small frames of instruction, self-pacing, active learner response to frequent prompts and questions, and immediate individualized feedback to responses.

These principles were in turn based on the behaviorist precepts of the noted psychologist B. F. Skinner, and were implemented in the United States at the University of Illinois in 1960 in the PLATO system (Programmed Logic for Automatic-Teaching Operations). The original PLATO was a mainframe system primitive by today's standards, but it reflected most of the basic Borkian elements: interactivity, individualization, and computer mediation. Using PLATO, students could be tested repeatedly for understanding and then could be prescribed additional appropriate remediation or enrichment materials. At great

expense, over 15,000 hours of instruction were developed for PLATO based on the behavioral model, representing perhaps the largest single investment in educational technology content ever made, even to this day.

PLATO was a limited success at best. During the 1960's, PLATO was a small system for a single classroom of terminals, but around 1972 new mainframe technology supported its transition to a system capable of serving up to one thousand simultaneous learners. Online chat and bulletin board notes features were added in the early 1970s, long before the Internet. In 1975, Control Data Corporation (CDC) entered the picture, establishing PLATO as a commercial educational product which, by 1985, had established systems in over 100 campuses around the globe. However, by the end of the decade, CDC found that the PLATO business model was not profitable and it shut down most PLATO operations, in part due to competition arising from the "microcomputer revolution" of the 1980s. By the 1990s, PLATO had ceased to exist as such, though remnants still remain.⁽²⁾

PLATO's lack of success does not erode the enthusiasm of current-day computer technology advocates because of several differentiating factors. PLATO tended to be linear in presentation, lacking hyperlinkages now common in learning software; it was weak in terms of multimedia usage; it antedated natural language processing; it antedated the Internet; and its reliance on mainframe computing was itself an obstacle to dissemination. Moreover, the PLATO philosophy involved long lists of behavioral objectives for each lesson, and long test-and-drill sequences for each objective, all of which could make for a tedious form of learning. Later educational technologists emphasized the importance of non-behavioral "active learning" approaches to learning, notably games, simulations, Socratic dialog, problem solving, discovery activities, and other forms of inductive rather than didactic education.⁽³⁾

Can creative approaches to online learning succeed where the objectives-drill-practice programmed learning model failed? On the plus side, there is no doubt that bright examples exist, ranging from MECC's "Oregon Trail" history simulation at the elementary school level to popular "psych lab" computer replication of classical experiments in psychology at the university level. On the negative side, several caution flags have been thrown out on the educational technology raceway. Hypermedia has proven much less popular than originally expected as it has been found that online learners minimize their use of non-required exploratory hyperlinks and instead prefer clear objectives arranged in a linear fashion. Computer gaming has made some inroads in business education but in most fields remains seen as peripheral or condescending. While educators love the notion of inductive learning through exploration and experiment, students typically take a utilitarian approach to courseware, wanting a more direct path to knowledge. An anecdote in this regard is the author's work with political science websites for Prentice-Hall, where market feedback has shown the most popular web features are the traditional drill/review sets.

This is a vision in which the alleged efficiency gains from educational technology are up for grabs. It is far from obvious that even the winning vendors will be able to capture the profits for traditional research and instructional objectives. Motivation is coming from legislators, governors, and others seeking to cut costs while delivering more education to meet growing demands from an expanding population and from adult learners more in need of retooling than ever before. It is doubtful that university presidents will be able to fund the necessary massive investment in educational technology, keep the legislature and governors at bay, and still capture the profits for faculty uses. More power to those who will be able to do so, but they will be the exceptions, not the rule. A likely outcome will be

the seduction of higher-paid faculty into overload teaching of online courses at pocket-money rates, distracting them from traditional research functions. An even more likely long-run outcome will be an increasing exploitation of a class of lower-paid workers (an "intellectual proletariat," one might say) delivering electronic instructional materials which are legitimated by a reduced number of higher-paid traditional faculty who play an oversight role, sometimes substantive, sometimes nominal.

Online Education and Learning Autonomy

Even when cost is not an issue, online education faces the paradox that it is best undertaken by students with strong autonomous learning skills, yet at the same time the disconnectedness of students from teachers seems correlated with insistent student demands for clearly structured learning assignments and schedules (Carnwell, 1998). Students frequently feel the need for ongoing communication with their instructor (Blakeley and Curran-Smith, 1998). A commonly expressed student need is that for very clearly and explicitly articulated course learning objectives (Stevens, 1977). That is, online pedagogy seems more associated with "cyberdistance" than with "virtual community," and students quickly become motivated to seek to overcome cyberdistance through increased course structure, reducing learning autonomy.

Unfortunately, something is lost when the rich complexity of what faculty teach and inculcate is reduced to a printed list of learning outcomes and test items used to assess each objective. Education is narrowed toward training. Studies show that lack of personal contact with a professor is associated with educational losses in role and process training (Eddy, Burnett, Spaulding, and Murphy, 1997). Moreover, a tremendous pressure is created to "teach to the test", which is what the assessment instrument in effect becomes.

When online education is part of a cost reduction effort, requiring human resources to be stretched to cover more credit hours, faculty resignation to the training mentality of outcome-based evaluation is all but assured except, of course, in environments which do not even bother to attempt to enforce quality assurance standards.

Online Education and Critical Thinking

It is often said among believers in online education, that the striking acceleration of social, economic, and technological change in the modern era is a powerful force for the ascendancy of online teaching methods since these can convey instantly updated information everywhere on the globe, delivering it to learners when and where they want, in their homes and workplaces for purposes of lifelong education. However, this same rate of change devalues instruction-to-facts (which are soon outdated) and instead places a premium on the more adaptive capabilities associated with education for critical thinking. Unfortunately, online education can handle instruction-to-facts more easily; drill-and-practice is the forte of computer methods. Ironically, in contrast, traditional education with its supposedly uncreative lecture hall methods has prided itself in its ability to inculcate critical thinking skills.

Distance education administrators are aware that critical thinking may be an Achille's heel of online methods. Therefore it is not unusual to find that quality assurance standards for online education make reference to student thinking skills, independent learning skills, teamwork and communication skills, and other aspects of critical thinking (cf. Wisconsin State Department of Public Instruction, 1998). Moreover, intelligent-agent and workgroup collaboration software often are targeted directly at encouraging critical thinking skills

(ex., in mathematics, see and Charnitski, 1998). Jonassen et al. (1999) argue that critical thinking can be inculcated using technology such as cyber mentoring and video theater.

A love-hate relationship exists between online education and critical thinking skill development. Wheeler (1996) notes the online information explosion demands students learn critical and evaluative skills to be able to sort the gold from the garbage, but many fear online information access overwhelms students and dulls their ability to differentiate. As another example, a geographic information system (GIS) is a visually-oriented discipline taught online at the author's university and elsewhere. However, Rose (1996) cogently argues that the focus should be on critical interpretation of visual information through group discussion methods her than on mastery of specific GIS software, as is typical of online courses on the subject. Writing assignments are thought to help develop critical thinking and while online methods can enhance collaborative writing, in general online courses are associated with less writing, not more. Socratic discussion with faculty is also thought to inculcate critical thinking, but while online methods in theory could enhance discussion, in reality online courses are associated with far less instructor-oriented discussion. Critical thinking is also thought to be associated with problem-solving going beyond computational mechanics to consideration of complex causal and value systems, but while intelligent tutoring software does exist, the open-endedness of creating problem-solving together with the asynchronous nature of most online education mean that in practice online courses rarely develop the problem-solving approach.

Because of the usual limitations of online methods, some of the best designs are based on using technology to supplement but not supplant traditional methods. A good example is CaseNET, a Web-based environment for teacher education, focused on case studies (Bronack and Kilbane, 1998). The online component of CaseNET is comprised of the

cases, discussion groups, journals and reference materials. However, students involved with CaseNET physically meet with one or more instructors at regularly scheduled times at a designated site. Instructors use reflective decision-making with a case methodology to guide through a five-step process which involves perceiving issues, problems, dilemmas, and opportunities; recognizing values and perspectives that drive actions; applying appropriate knowledge; suggesting an action one might take; and examining the possible consequences. The CASENET model and other hybrid approaches like it seek "the best of both worlds" of online as well as traditional educational methods, but in doing so they call upon universities to incur the costs of both methods, which explains why hybrid approaches are not part of the vision of online education as articulated by Bork and other enthusiasts. Likewise, the hybrid model, by requiring physical meetings, cannot aspire to be the global solution to mass education that is central to the Borkian vision.

Online Education and Educational Quality

In comparing computer-mediated distance education with traditional face-to-face teaching experiences, Cravener (1999) has found that while distance education increases access to education, one may well find decreases in instructional quality brought about by increased faculty workload, problems of adapting to technology, difficulties with online course management, and related obstacles. Down "in the trenches" the rank-and-file online instructor finds grinding courseware development time costs, burdensome maintenance requirements, intrusive student e-mail demands, open-ended needs to stimulate and supervise online discussion, and other practical difficulties. Online instructors must put forth more effort and are likely to receive less reward, whether in recognition or compensation.

Problems from the instructor viewpoint do not necessarily translate into lower student performance on output measures. In fact, a common finding in the educational technology evaluation literature is that online courses do not have a differential performance impact (ex., see Blakeley and Curran-Smith, 1998; English, Harrison, and Hart, 1998; Plasschaert, A.J., J. G. Cailleteau, and E. H. Verdonschot, 1997; Day and Payne, 1987). By focusing on instruction to learning objectives, as with traditional instruction-to-test approaches, test performance standards are usually met by online courses.

Although tested output of electronic education is often on a par with conventional teaching, this does not mean educational quality is unaffected however. Many observers find in typical online education offerings a substantial narrowing of the concept of education to the detriment of students. To illustrate, Modiba's (1997) analysis of the quality of distance education for in-service teachers, based on in-depth interviews which go beyond simple cognitive testing, noted the narrow view of education theory generally presented and lack of consideration for the experiences and views of practicing teachers.

One of the recurring problems of computer-mediated education is that it is programmed around concrete learning objectives. Many educational technology writers, in fact, explicitly argue that quality education using computer methods must be built on a foundation of clearly-defined competency-based curricular objectives (ex., Bergeron, 1996). This is, in fact, the prevailing view. Moreover, when computer-mediated curricula lack such clear articulation of competency objectives, students tend to demand they be provided. Yet competency-based objectives are composed of domain-specific facts, knowledge, and cognitive skills which may be summarized as the science of whatever is being taught but not its art. That is, teaching to competency objectives encourages, even forces instructors to neglect the diffuse in favor of the concrete. Not only is this the

opposite of the ancient concept of a liberal education but it is also sharply at variance with learning needs in an era of rapid change when the specific is transient and the abstract is that which must carry the learner through a lifetime of education and re-education.

The bandwagon for online education has begun, pushed by rising costs of computer technology in times of austere budgets, creating a compelling logic that calls for using that technology to reduce educational costs per credit hour -- which is often tantamount to reducing faculty costs (Barnard, 1997). Popular works such as *The Monster Under the Bed* (Davis and Botkin, 1994) and *The Digital Economy* (Tapscott, 1996) portray education as slipping out of the hands of universities and into the hands of business organizations better able to make the hard economic choices involved in exploiting online technology to its potential. Yet as noted by Martin Ringle (1996: 32), "Being able to read an electronic text, examine a digital image, or conduct a video-conference on the Internet, is not the same thing as sitting in a circle on the lawn and reading passages of *The Iliad* aloud." As a supplement to face-to-face education, online technology is useful. As a replacement, it is a threat to liberal education.

It is small wonder that online education is now arousing academic resistance. The American Federation of Teachers, for instance, has gone on record against this and other forms of distance education unless and until there is assurance that faculty standards will be upheld (Blumenstyk, 1996). The head of the University of Maine system was recently ousted amid the furor that developed when he proposed that a distance learning operation receive full-blown degree-granting status as an additional "university" within the Maine system. In Spring, 1997, the faculty at York University, Canada's third largest college, went on strike for two months, settlement of which included formal contractual protection against mandatory engagement in online education.

There is great skepticism in academia that online education is pedagogically sound. A recent strategic forecasting exercise involving eighty university administrators at the University of Pennsylvania concluded that "academic brilliance is fostered in the social ambience of the university which cannot be replaced by computer teleprograms" (DeLoughry, 1995). This is consistent with the findings of authors such as Shields (1996) and Noble (1997), who argue that computer-mediate learning is exacerbating cross-institutional inequalities, compromising the traditional autonomy of universities vis-a-vis the corporate sector, and therefore should not be used in substitution for traditional methods of education. They condemn the practice of UCLA in the United States or York University in Canada of establishing for-profit alliances with private corporations for the purposes of purveying online education.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

The research design that will be used is case study method.

The case study is about the Institute of Advanced Technology. There are four branches of IAT in Nairobi.

The population of study will include the instructors from each center, the front office personnel, students and the technical support employees.

To get the required data, questionnaires were administered and interviews conducted. In addition, the available data on training in the organization were also analyzed to determine the policies that the organization has put into place to meet the training needs, from the other organizations.

Analysis of data was done using statistical tools like bar charts, pie chart and tables.

3.1 RESEARCH DESIGN

3.2 Sources of Data

This study involved primary research in the field .The researcher obtained data through Interviews and Questionnaires which were analyzed accordingly to the questions asked. In addition, the researcher used the records at the Institute of Advanced Technology to obtain historical data on training over the years.

3.3 Methods of Data

The researcher visited various organizations and interviewed top management with a view of obtaining the training policies available therein. In addition, the researcher collected data from magazines, government gazettes, reports and other secondary materials.

The study will be conducted in the Institute of Advanced Technology in Nairobi.

The Loita, Westlands and Yaya branches were used to collect data.

Loita was chosen as it offered all the computer courses, unlike the other which offered a few.

3.4 Data Processing and Analysis Strategy

The study evaluated the contents of the data collected by comparing the arguments of the various authorities captured in the literature review. Each thematic area set up was analyzed and gaps of knowledge assessed on how they could field.

3.5 Interpretation and Presentation of Results

Mainly textual, with a few graphics, tables and figures. Each Theme was presented separately and the findings were critically analyzed.

The textual findings were critically analysed as they were mainly policies from top management of organizations.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.0 INTRODUCTION

A critical analysis of data is used. The analysis produced the findings of the study which have been discussed at length. Tables and charts were used to make the analysis more meaningful and interpretation easy.

The chapter is divided into two major sections. The first section gives an analysis of the categories of institutions that have trained their employees in IT. The second part seeks to determine if training is the sole component that gives institutions an edge to their competitors

4.1 Respondents

A total of 100 questionnaires were prepared and distributed to respondents. 66 were duly completed and returned.

Ina addition, interviews were done. 10 managers from both private and public institutions were interviewed.

4.2 Findings and Interpretations

Table 1: Respondents by Gender

Gender	Frequency	Percentage (%)
Male	39	59.1
Female	27	40.9
Total	66	100

All respondents indicated their gender, of which 59.1% were male and 40.9% were female. This underscores the fact that most organizations' workforce are male dominated. However, the number of working women has over the years grown. The need to upgrade skills is also seen as an equal opportunity requirement. More women are taking up the challenge to grow in the career ladder.

Table 2: Respondents by company type

Type of Organization	Frequency	Percentage (%)
Governmental	20	30.3
Private	46	69.7

From the table, it is evident that more private organizations train their employees as compared to government institutions. This explains why many government offices are still using manual systems to run their business. On the other hand private companies have automated their systems to make work easier and more productivity is seen as desirable

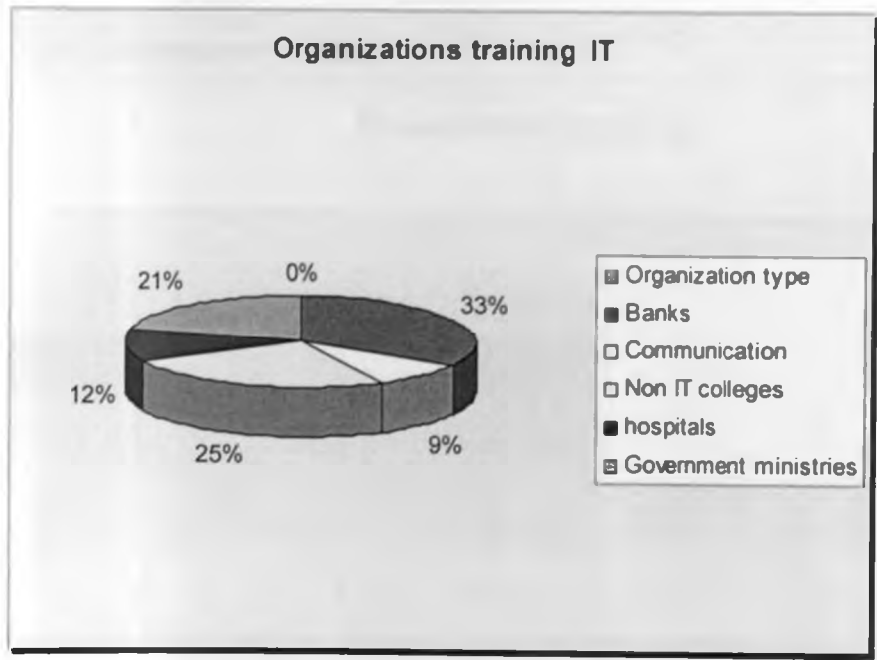
Table 3: Respondents by Courses undertaken

IT course	frequency	Percentage (%)
Computer Applications	40	60.6
Maintenance	15	22.7
Networking	4	6.1
Accounting packages	5	7.6
HR packages	2	3.0

From the table above, it can be deduced that most organizations are training their employees on the basic computer applications. This was shown by the 60% of respondents taking computer applications

Professional packages like Hr and Networking scored the least indicating that organizations have a challenge in ensuring that more employees are trained in these crucial areas.

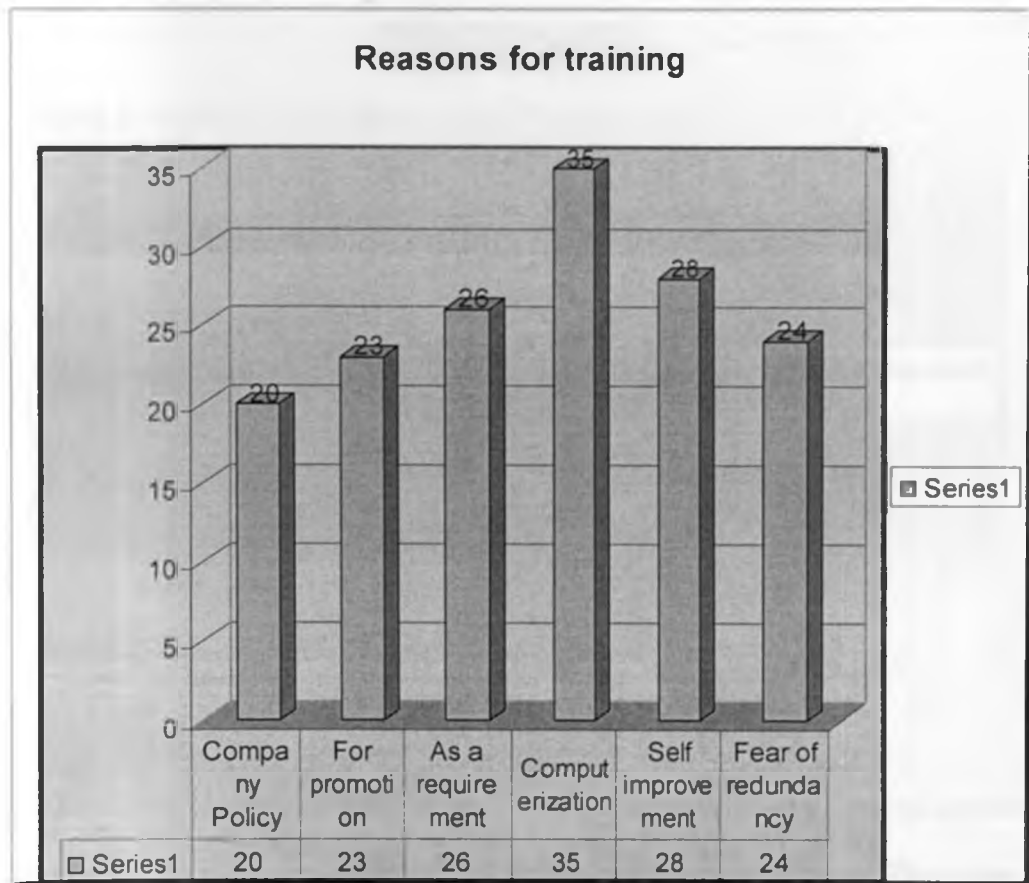
Chart 1: Categories of organizations training employees IT courses relevant to their jobs



From the chart, it is clear that organizations like banks, non IT colleges are training employees with IT skills. This is in the light of the nature of the work they do. For example, banks are more productive and effective with computerized systems. Globalization plays an important role too. Banks need to compare data and communicate internationally hence the trends in training.

Government ministries lag behind with only 21% of employees undertaking the training. This is low compared to the fact there are many government ministries which have employed thousands of people.

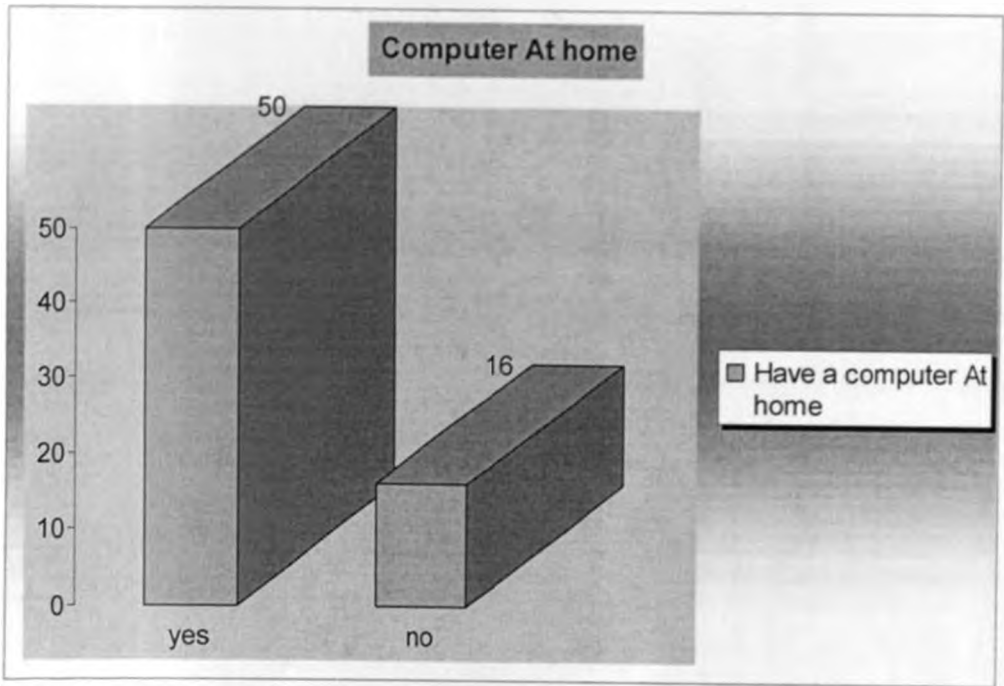
Chart 2: Reasons for Training



From the cart above, majority of employees train due to computerization at the work place. This has rendered manual systems inapplicable, hence the huge percentage of 35%. Other reasons which came out strongly included; requirements by the company, for self improvement, fear of redundancy and for promotional reasons.

Most companies have put in place policies that require employees to undergo training annually or otherwise stated.

Chart 3: Trainees with computers at home



From the chart, it is evident that most people have computers at home. The research found out that out of the 66 respondents, 50 indicated having computers at home. This points out that more people are investing in Technology to make their personal as well as career lives more profitable

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This is the final chapter of this study and it contains the summary, conclusions, general recommendations and recommendations for further research. It is hoped that the recommendations will influence the organizations to take a critical look at the training needs of the staff, especially the older once.

5.1 Recommendations

1. Low Level of Awareness

It is recommended that the levels of awareness as regard the impact of ICT in the society to be raised. The government, private sector and non governmental organizations all have a responsibility to come up with policies that will create awareness

2. Lack of objective information regarding the benefits and costs of adoption of ICT

There is Need to encourage SMEs to develop and use systems which recognize and report intangibles in ways that can be reliably used by investors, valued by capital markets and guide better management practices

3. Role of Government

While the responsibility for adoption of ICT lies with all stakeholders, government has a key role to play in the creation of an enabling environment and is ideally suited to provide encouragement as a model-user or standard setter. Through the right policies and education at the grassroots, the government provides the largest tool to ensure that ICT is available to the masses.

3. Scope for further research in the same field

The study recommends that the following areas be considered for further research:

- Adequate research to increase understanding on the role of government in ICT development.
- The impact of training to the economy

5.2 Results of the study

1. Training Expenses

The largest expense for HRD programs, by far, is attributable to the time spent by the participants in training programs, career development, and/or organization development activities. In training, costs due to lost production and travel time can be as much as 90-95% of the total program costs. Direct and indirect costs for the delivery of training are about 6% of the total cost, and design and development count for only about 1-2% of the total. Realistically, it makes sense to invest in an assessment of needs to make sure an organization makes a wise investment.

2. Shift from manual to computerized systems

The study revealed that more employees are skilling up in computers due to the move by organizations to computerize their systems. Without the skills, employees see themselves redundant and may eventually lose their self worth and face the sack as a result. It is evident that nearly 70 % of those interviewed took on the challenge of going to school to remain relevant in the job place.

Employees in the private sector are more apt in getting more skills and moving away from manual systems as compared to those in the public sector. This is a very important observation as it clearly shows that the private sector is more receptive to changes in Technology. Over 80% of the respondents were from the private and non governmental institutions. As the economy shifts to one in which the value of strong minds increases relative to that of strong backs, employers seek skilled and educated workers. The demand for education thus increases

3. Global Village and multinationalism

It is without a doubt that the world has become a global village. Businesses no longer operate as though they were on their own islands. Transactions from other continents and countries are now possible thanks to technology. It is only organizations who have seen the need to train their personnel on the relevant fields that reap these benefits. For example banks can now communicate internationally and transactions closed.

Multinational organizations are able to monitor the performance of their branches worldwide as they collect the relevant data and analyze within a short time.

4. Role of internet in information

The internet is the main source of information of all nature. For organizations to understand the way businesses are doing, they cannot afford to lag behind on this aspect. Through monitoring the stocks in the market, the major currencies and performance of the world's economies, organizations can make intelligent and informed decisions that will boost them or cushion them from adverse environmental aspects. Without proper training and needs assessment, organizations can end up making huge losses which could have been prevented.

5.3 Summary

Based on the results of this study, it can be concluded that organizations are spending a huge chunk of finances to train their personnel in order to improve on their productivity. It is also worth noting that organizations are moving away from manual to computerized systems hence the need for training. This is a fair conclusion which accounts for all the respondents in the research.

The study has established that the need to remain relevant in the work place has driven many employees to seek to improve on their skills and acquire more. Many employees can now multitask on their work which in turn means a cost cutting on the part of employers. Training Institutions such as the Institute of Advanced Technology are very instrumental in ensuring that IT skills are acquired and utilized by the organizations and individual students.

The introduction of ICT results in the “flattening” of hierarchies and promotes greater involvement of the workers in management. Firms therefore have to deal with technological and organizational changes simultaneously putting a demand on their resources for technical skill and organizational upgrading at the same time.

Satisfying these demands also necessitates overcoming business culture and organizational politics.

Skilled or more-educated labor is more complementary with new technology or physical capital than is unskilled or less educated labor. Lack of ICT skills and business skills are widespread impediments to effective uptake once adoption decisions are made.

Technological change induces the demand for better-educated and skilled workforce.

Governments have major roles in providing basic ICT skills in compulsory schooling.

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Appendix 1: Questionnaire.

Dear Respondent

This questionnaire is intended to gather information that will be analyzed for academic purpose only. This is a requirement by the University of Nairobi. Kindly fill in all the questions.

Your time and response is highly appreciated.

Thank you.

Stella Chelangat- Faculty of External Studies

1. Your Gender

- a) Male
- b) Female

2. Age group

- a) 20-30
- b) 30-40
- c) 40-50
- d) Over 50

3. From which organization are you from?

- a) Private
- b) Government

4. Your organization deals with? _____

5. Which course are you undertaking?

- a) Computer Applications
- b) Maintenance
- c) Networking
- d) Others (please specify)

6. What prompted you to take the current course?

- a) Company policy of training individuals
- b) For promotion
- c) Requirement by the organization
- d) Computerization of my organization
- e) Self improvement
- f) Fear of redundancy

g) To prepare for retirement

7. Who is paying for your course?

- a) self
- b) company

8. Which department are you at your work place?

- a) HR
- b) Finance
- c) Administration
- d) Sales and Marketing

9. Do you have a computer at home?

- a) Yes
- b) No

10. When was your last personal performance evaluation?

11. If you have had a performance review, do you recall whether you were able to discuss needs and issues at that review?

12. Can you identify any training needs that would help you in meeting the operational goals of your unit?