UTILIZATION OF COMPUTOR LABORATORY AND STUDENTS' ATTITUDE TOWARDS INFORMATION TECHNOLOGY: A STUDY OF SECONDARY SCHOOLS OF KHYBER PAKHUNKHWA

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ABSTRACT

This study focused on the investigation regarding the use of computer laboratories in the secondary schools of District Mardan, KP, Pakistan. It further explored the attitude of students towards the use of information technology. The availability of the labs were investigated through the perceptions of target population. Teachers' perceptions were elicited through survey design where questionnaire was utilized as major tool for collection of data. Simple mean statistic was applied in order to analyze the date. The study's findings indicate that the mean score of 4.53 suggests that the respondents expressed a favourable attitude towards the use of computers as a novel approach to information technology in the context of education. Computer technologies have shown to be important in many educational contexts, such as e-learning, distance learning, and training programmes. These technologies have significantly contributed to enhancing the overall quality of education and the proficiency of educators. The research suggests that the provision of computers to training institutions for teacher training might be beneficial in enhancing their knowledge and facilitating professional growth and development. The use of computer emerging technology has potential for enhancing pre-service teacher training.

Key words: Computer laboratory, information technology, students' attitude

INTRODUCTION

In contemporary society, the fields of computer science and information technology have acquired significant significance, resulting in profound transformations in several aspects of our daily life. We have been exposed to information technology, computers, and the internet at an accelerated rate. Consequently, our lives have become entirely reliant on the most recent advancements in computer technology. The advent of the computer has played a pivotal role in enabling the development and proliferation of high technology in the contemporary world. Database services and computer networks provide a wide range of information resources.

The aforementioned technology has significantly contributed to the advancements in the domains of energy, modern agriculture, the dissemination of educational knowledge, and the quick progress seen in the area of medical. Education serves as the structural framework, while Information Technology (IT) functions as the fundamental underpinning and significant achievement for this framework.

Technology has a pivotal influence in all domains of human existence. The area of education has seen widespread adoption in affluent nations. Developing nations are gradually incorporating technology into their educational systems, although at a very slow rate. The use of technology primarily seeks to employ various gadgets, methods, and tactics, in addition to textual content, to enhance the process of learning.

According to Aggarwal (1995, pp. 1-2), technology encompasses two distinct aspects. 1) The term "technology" refers to the application of scientific information and methodologies that are implemented by an organisation. Technology as a social process refers to the use of scientific and systematically organised knowledge.

It may be argued that technology serves as a catalyst for the advancement of scientific knowledge and facilitates transformations in societal processes.

A computer is an electrical device capable of receiving and processing a predetermined set of information, executing programmes, and doing various types of data manipulation and calculation.

The use of computers has significantly contributed to the automation of production facilities. The contemporary communication methods have been improved. These instruments are considered indispensable in almost all domains of study and applied technology.

Hence, computer education plays a crucial role in fostering the development and progress of a nation. We now reside in an era when our lives are heavily reliant on computer technology. The advent of new scientific breakthroughs has brought about a profound transformation in the human experience. The fast advancement of information technology has led to a rise in the conveniences of everyday living and a reduction in the geographical distances between nations.

Scheffler and Logan (1999) emphasise that the integration of computer technology into the traditional classroom setting encompasses more than simply acquiring computer skills. It also involves a process in which learners attempt, albeit sometimes unsuccessfully, to access, evaluate, and analyse data in order to apply meaningful tasks, such as analysing data, applying knowledge, and engaging in collaborative communication. The use of computer technology in education entails the utilisation of tools that facilitate the teaching of subject matter and the cultivation of problem-solving and higher-order thinking abilities. Neither computer literacy nor computer awareness is present. The use of computers is regarded as the most effective means to achieve educational goals. There is a need for modifications inside an educational institution. It is imperative for the whole school community, including students, parents, teachers, and administrators, to acknowledge the ubiquitous presence of computers and other technological devices inside the realm of daily school activities.

Scientific advancements have significantly enhanced the richness of our social lives. Therefore, science has assumed the role of serving humanity. This intervention is yielding remarkable results for our organisation. It is important to ensure the provision of essential requirements, such a reliable water supply, power, state-of-the-art technological equipment, and other indispensable materials and instruments. Additionally, enough ventilation and cleanliness must be maintained to meet the basic needs of individuals. The availability of suitable resources and facilities is essential for the achievement of excellent instruction. The educational landscape inside schools is undergoing a shift from traditional reliance on books and papers towards an increasing integration of computer technologies. Ensuring equitable computer access for all pupils, irrespective of parental financial capacity or inclination to invest in computer technology, is a significant consideration in the realm of computer technology.

The researcher has the viewpoint that the current state of computer laboratories for secondary school pupils is largely insufficient. Therefore, it is essential to assist students in optimising the use of these few resources. The integration of computer technology in schools offers advantages to both educational institutions and their students via the diversification of instructional content within the classroom setting. According to the California Research Bureau, computers provide instructors the capability to deliver instructional content to the whole class via the use of projection technology, hence facilitating the incorporation of visual elements such as images and videos. This enables a wider range of educational possibilities compared to the conventional use of chalkboards or whiteboards. Additional advantages for students include the use of simulation software, which facilitates their learning process via interactive engagement with computer software, therefore using the diverse array of multimedia resources accessible on the computer platform.

In an era characterised by globalisation and heightened rivalry, the advancement of emerging nations necessitates the identification of domains in which they possess distinct advantages over their rivals. Such advantages may stem from a well-educated workforce, favourable natural resources, or scientific and technical skills. The involvement of science and scientists may significantly contribute to the identification of options and the effective implementation of development initiatives.

1. OBJECTIVES OF THE STUDY

Objectives of the study were given as under:

1) To find out the current state of computer labs at the secondary level in District Mardan, an assessment will be conducted to evaluate their quality.
2) To examine the extent to which computer labs are used in the teaching and learning process at the secondary level.
3) To investigate students' perceptions and attitudes about the use of computers and information technology (I.T.).

2. Research Questions

1. What is the current state of computer labs in terms of quality in upper secondary schools?
2. To what extent are computer laboratories used in the teaching and learning process?
3. What is the prevailing attitude of kids towards computers in the district of Mardan?

LITERATURE REVIW

Public schools have a responsibility to provide students with the necessary skills in digital competence, enabling them to effectively engage with online resources and excel in an increasingly technology-driven professional environment. For students to properly use technology as a means to enhance their learning, it is essential that they possess both unrestricted access to the technology and the necessary proficiency to employ it proficiently (National Educational Technology Standard for Students, 1998).

The integration of computer technology in the classroom is a significant concern within the field of education. While there is a recognised need in incorporating computer technology across different academic disciplines, educators have expressed concerns over the underutilization of computers by a significant portion of instructors (Bogwell & Stetson, 1999).

Over the course of the last decade, there has been a notable growth in the accessibility of computers and other associated technology in educational settings. In the year 1989, the ratio of computers to students in the United States was 1:37. According to the source "Technology Counts" in 1999, the ratio was at one to seven. According to the report "Technology Counts" in 1999, it was observed that a majority of computers were situated outside of designated computer labs. However, a mere 15% of the country's educators had received a minimum of nine hours of training in the field of technology.

Presently, educational institutions are rapidly incorporating technological resources into their curricula. Nevertheless, recent scholarly investigations indicate that the typical American school continues to underutilize computers, and a considerable proportion of schools have restricted availability to any kind of technology (Flores, 2000).

Furthermore, it has been observed that educators, particularly those in the field of information and communication, are not fully using the technological resources at their disposal (Bogwell & Stetson, 1999). A significant number of educators stick to conventional teaching techniques and have limited use of computers, mostly for supplementary activities or extracurricular events that are not part of the prescribed curriculum (Logan & Schaffer, 1999).

According to Logan and Schaffer (1999), the provision of high-quality in-service programmes for teachers has not adequately kept pace with the rapid advancements in technology. Furthermore, teacher training in this domain has also lagged behind.

Regrettably, the availability of adequate computer equipment in educational institutions is not always ensured. Securing funding to facilitate the integration of computers in educational settings is often a challenging endeavour. State legislatures and other regulatory organisations have shown that the allocation of funds has positively impacted student progress. Hence, school districts with constrained funds inquire about the optimal allocation of existing computers, pondering if they should be deployed in individual classrooms or centralised in a computer lab. The subject at hand has engendered much debate due to the constraints imposed by limited resources, the need for educational institutions to optimise the use of technology in fostering scholastic success, and the necessity of accommodating the varying proficiencies of both educators and learners.

According to Rashid M. (1993, p.20), it is crucial for policymakers to have an understanding of the significance of educational technology and its vital role in achieving organisational goals.

This discourse highlights the importance of all individuals within the organisation, regardless of their hierarchical position, possessing knowledge and understanding of educational technology.

In his work, Rashid M. (1998, p.30) articulates his perspective on the need of incorporating educational technology inside the realm of education.

1.1.2 The Role of Educational Technology in Process of Education

The field of education is undergoing significant transformations and experiencing a growing need for expanded educational initiatives, especially in higher education. This necessitates the allocation of more resources and financial assistance to students, in order to enhance access to various educational opportunities and resources.

The pursuit of excellent education necessitates the use of a wide range of methodologies for comprehensive instruction. The use of contemporary educational technology offers the capacity to confront the obstacles encountered in the realm of education, while also augmenting productivity and efficacy.

New Educational Demands

The successful launch of Sputnik, an unmanned satellite by the Soviet Union in 1957, served as a catalyst for recognising the significance of educational reform in both the interests of national leaders and the general populace. The current era may be aptly characterised as a period of significant educational reform, owing to the implementation of both domestic and global initiatives aimed at improving educational systems.

Although certain issues in education were not novel, there were also emerging demands that were altering the fundamental framework of the educational system. Initially, there was a shift in the national ideology wherein the focus shifted towards providing widespread access to education for all individuals inside the nation.

RAPID GROWTH OF COMPUTER-BASED EDUCATION

During the latter part of the 1960s, the National Science Foundation (NSF) provided assistance for the establishment of 30 regional computing networks with the aim of facilitating widespread accessibility to computers. These networks included a total of 300 institutions of higher education, as well as a number of secondary schools. By the year 1974, a significant number of students, over two million, were using computers as an integral part of their educational experience. In the year 1963, a mere 1% of secondary schools throughout the country included computers for educational reasons. By the year 1975, a majority of 55% of educational institutions had acquired access to computers, with a notable proportion of 23% using these technological resources mainly for instructional purposes.

Learning-on-Demand

Gerhard Fischer, a scholar affiliated with the University of Colorado, is actively redefining the concept of knowledge-based settings in order to facilitate learning-on-demand. The realm of employment has undergone significant transformations in response to the emergence of science-based information systems. Consequently, it is imperative to adopt novel pedagogical approaches that enhance individual knowledge and cultivate problem-solving abilities, thus equipping individuals to address present and future challenges within the professional sphere.

Research Design

Population of the study:

1. The study's population included 111 schools located in District Mardan, as well as the computer teachers and students associated with these institutions.
2. The research consisted of a population of 96 Government High schools for males in the District of Mardan.

Sample of the study:

The objective of this research was to investigate the accessibility and use of computer laboratories. The researcher employed non-probability purposive sampling techniques to select schools for the study. Specifically, all schools with computer labs were included in the sample. Additionally, a cluster random sampling technique was utilised to select students for data collection, in order to investigate the research problem.

Data Collection Instrument:

A checklist was devised for the principals and teachers of the designated schools to ascertain the status of computer facilities and other essential resources. The questionnaire was used as a means of gathering data from the student population.

DATA ANALYSIS

The data that was gathered was analysed in alignment with the specific aims of the research. The data was analysed using a basic mean test.

Level of Availability

1	Computational resources are provided inside the educational institution for the benefit of the student body.	**0.32**
2	A printer is provided for the children inside the school premises.	**1.01**
3	The school provides internet facilities for the kids.	**1.0**
4	The school provides pupils with access to a projector.	**1.0**
5	Television is provided for the pupils at the educational institution.	**1.0**
6	Mobile devices or phones are accessible to students.	**1.07**
7	Cassettes are provided for the children inside the school premises.	**1.07**
8	The school provides projector screens for student use.	**1.0**
9	A photocopying machine is provided for student use at the school.	**1.0**
10	Software applications are accessible to students inside the educational institution.	**0.25**
11	The school provides a fax machine for student use.	**1.0**
12	Tape recorders are provided for student use inside the educational institution.	**1.17**
13	Calculators are provided for the pupils inside the educational institution.	**4.16**
	Cumulative mean	**1.075**

The cumulative mean of 1.075 indicates that the respondents did not express agreement on the availability of computer hardware and computer labs. The participants reached a consensus that computers were really present to a certain degree, but their presence was deemed insufficient. While the students are granted access to the computer labs, there is an insufficient provision of facilities to accommodate every student.

Utilization and application of computer laboratory

1	Students are provided with the opportunity to use a computer laboratory.	**4.06**
2	The students possess fundamental understanding of computer systems.	**4.01**
3	Computers serve a multitude of functions inside educational institutions.	**2.96**
4	Computers play a crucial role in enhancing the fundamental abilities of pupils.	**3.47**
5	The management of data may be facilitated by the use of computers, resulting in increased ease and efficiency.	**3.71**
6	School records may be digitally preserved and stored inside a computer system.	**4.5**
7	Computers play a key role in the creation of maps and other visual representations.	**2.75**
8	Editing and modifying content is facilitated by the use of computers.	**4.08**
9	Students have the opportunity to acquire knowledge by using several educational software programmes that may be installed on their computers.	**3.23**
10	The printer is used for the purpose of producing hard copies of papers.	**3.64**
11	The projector facilitates the display of various objects via projection.	**3.0**
12	Handsets serve as a means of communication between staff members and the principal.	**2.57**

13	Television serves as a valuable tool for educational purposes.	**3.17**
14	The use of radio as a medium serves to facilitate the dissemination of information and support educational endeavours.	**2.98**
15	The photostat machine is capable of producing photocopies.	**4.83**
16	The sharing of information may be facilitated via the use of the internet.	**3.12**
17	The internet has the ability to rapidly access a wide range of information.	**2.91**
18	The most efficient method for obtaining information is via rapid access.	**4.84**
19	Computers have the potential to serve as a means of enjoyment for pupils.	**4.49**
20	The use of computers is crucial in contemporary society.	**4.52**
21	The use of computer technology in education has been shown to boost students' comprehension and understanding.	**4.76**
	Cumulative mean	**3.69**

The average score of 3.69 indicates that the participants had a positive inclination towards the use and implementation of computers and computer labs. The participants expressed a positive inclination towards having access to computers and computer labs. The many devices or tools used in computer labs provide valuable assistance to pupils. The use of computer and computer labs may provide students with several advantages. The use of computer technology is advantageous in the context of educational endeavours. In the contemporary age characterised by advanced information and communication technologies, pupils have ever greater access to a wealth of knowledge via computer-based platforms.

TRENDS TOWARD THE USE OF COMPUTER

1	The use of computers for educational purposes has emerged as a recent trend.	**4.8**
2	The computer serves as a platform for self-directed learning.	**4.62**
3	The use of computers for distant learning is now a prevalent trend.	**4.39**
4	Books may be accessed and consumed in electronic formats such as e-books or e-learning platforms.	**4.64**
5	The use of the internet facilitates the acceleration of e-learning processes.	**4.75**
6	One may get knowledge about international publications via the use of the internet.	**4.75**
7	The use of information technology facilitates the accessibility of several libraries.	**4.62**
8	Data or information may be rapidly downloaded.	**4.16**
9	The computer serves as a valuable tool for facilitating the interactive display of instructional content.	**4.55**
10	The field of information technology is increasingly offering a multitude of chances for individuals to access and engage with literature pertaining to similar subject matters.	**4.78**
11	The use of computers has the potential to enhance the quality of education.	**4.84**
12	The use of computers has the potential to enhance the proficiency of an educator.	**4.58**
13	Computers have a beneficial role in training initiatives.	**4.91**
14	Computers play a significant role in enhancing the instructional capabilities of educators.	**4.67**
15	The use of computers proves to be very beneficial in facilitating the delivery of educational information for both pre-service and in-service teacher training.	**4.26**

16	Computer technology enables the facilitation of remote communication and engagement across long distances.	**3.67**
17	Classroom management is a valuable tool in educational settings.	**4.17**
	Cumulative mean	**4.53**

The average score of 4.53 indicates that the participants expressed a positive inclination towards the use of computers as a contemporary approach in the field of information technology, specifically for educational purposes. Computer technologies have shown to be valuable tools in many educational contexts, such as e-learning, distance learning, and training programmes. Their use has contributed to the enhancement of both education quality and teacher effectiveness.

Problems and Issues in the use of computer

1	The overutilization of computers has the potential to negatively impact the visual health of kids.	**1.83**
2	The over use of computers has detrimental effects on the physical well-being of kids.	**1.24**
3	The process of acquiring knowledge via the use of computers is often seen as being time-consuming.	**2.69**
4	The improper use of computers is considered to be detrimental.	**0.87**
5	Software for computers is readily accessible in many locations as needed.	**4.57**
6	The perpetration of cyber-crime and the unauthorised acquisition of data are facilitated by computer systems.	**2.28**
7	The use of computer-based learning methods may potentially diminish the inclination to engage with traditional printed textbooks.	**1.43**
8	The use of computers among students has been seen to contribute to a rise in indolence.	**1.42**
9	The computer plays a significant role in facilitating the contact between the principal and personnel.	**2.64**
10	The use of computers has been shown to enhance collaboration between teachers and principals.	**3.07**
11	The use of this tool by the organization's chief may enhance the efficacy of monitoring and management practises.	**4.17**
	Cumulative mean	**2.38**

The cumulative mean of 2.38 indicates that the respondents did not express agreement with the problem and difficulties associated with computer use. They exhibited a lack of preference towards the notion that computers has negative applications. The prevailing belief is that computers are very advantageous tools, serving a wide range of purposes across several domains. Furthermore, it is often held that the use of computers is beneficial in all aspects of human existence, with no discernible negative consequences in contemporary times.

Findings/Recommendations:

1) Research may be undertaken to generate awareness among individuals on the significance of computers and their applications at the school level.
2) In the current age, characterized by the prevalence of information and communication technology, many forms of communication have been significantly facilitated by the use of computers and other technical devices.
3) The use of computers in training colleges is recommended to facilitate teacher training, therefore augmenting their knowledge and affording them the possibility to achieve professional development and expand their skills.
4) The use of computer emerging technologies is recommended for the purpose of pre-service teacher training.
5) It is recommended that projectors be provided to every school for the purpose of enhancing scientific laboratory facilities.
6) It is recommended that each school be equipped with subject-specific software.

7) The use of radio and television should be primarily directed towards educational goals in order to maximise the benefits derived by the majority of people.
8) It is recommended that multimedia resources be made available to all schools in order to facilitate the development of educational programmes for the teaching and learning process.
9) It is essential to build computer labs in every secondary school.
10) Educators must to provide instructional sessions to equip themselves with the necessary skills and knowledge for proficient and appropriate use of computer technology.
11) In order to facilitate connectivity, it is imperative that all educational institutions establish computer networks.
12) It is important to build a well-structured technique and management system via the use of computer technology.
13) The use of computer laboratories at the secondary level assumes a crucial function in the educational process.
14) The use of computer and educational technology has the potential to enhance and refine the fundamental abilities of pupils.

Trends towards the use of computers:

The field of computer technology has had significant progress in the last twenty years, mostly driven by the increased need for personal and institutional computing devices. It is anticipated that the aforementioned tendency will persist over the course of many years, resulting in a gradual decline of Personal Computers (PCs) as the predominant catalyst in the advancement of computer technology. The computer labs showcase emerging technologies that have the potential to augment or replace personal computers, therefore ensuring the continued prevalence of computing devices in the foreseeable future. The advent of developing products and equipment, such as Internet appliances and smart accessories, will exert pressure on the computer industry to sustain its ongoing trajectory of providing computers that are faster, more compact, and more affordable.

Software applications and operating systems are not designed to effectively use the computational capabilities offered by many cores. Gradually, this phenomenon will undergo transformation. At now, there are 64-bit iterations of Linux, Solaris, Windows XP, and Vista operating systems.

Nevertheless, it is worth noting that the current availability of 64-bit versions for a majority of device drivers is limited. Consequently, the use of a 64-bit operating system in contemporary times may prove to be a source of frustration owing to the scarcity of accessible drivers. One emerging trend in the field is the construction of high-performance computing environments via the use of computer clusters. These clusters consist of a collection of loosely interconnected computers, often linked by high-speed local area networks. A cluster is a collaborative system that enables the utilisation of several processors as a unified computing entity. Clusters are often used to enhance performance beyond what can be achieved by a solitary computer, while sometimes being much more cost-effective compared to single machines with same speed or availability. Beowulf is a conceptual framework for the construction of high-performance parallel computing clusters, which are comprised of costly personal computer hardware components. The initial development of the technology may be attributed to Thomas Sterling and Donald Becker, who were affiliated with NASA at the time. The nomenclature is derived from the primary protagonist in the Old English literary masterpiece known as Beowulf.

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