EVALUATION OF THE SUBJECT OF COMPUTER STUDIES IN SECONDARY SCHOOLS

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ABSTRACT

The topic of the research was "Evaluation of the subject of computer studies in secondary schools ". Main objectives of the study were; (i) To find out the present status of the subject of Computer Studies in Secondary schools in respect of the objectives stated in the National Curriculum. (ii) To evaluate the role of teachers, students, educational administrators and facilities provided for the teaching of Computer Studies in Secondary Schools. (iii) To compare the standard of teaching of Computer Studies in secondary Boys' and Girls' Schools.(iv) Exploring the hurdles being faced in teaching of Computer Studies in Secondary Schools.

The study was delimited to secondary schools, offering Computer Studies at secondary level. The study consisted of three populations; one was comprising the principals of all the twenty secondary schools which were offering Computer Studies as a subject at secondary level, second was the teachers who were teaching Computer Studies at secondary level in all the twenty secondary schools and the third was all the students of 9th classes, studying Computer Studies as a subject at secondary level. Samples of the study were; all the principals, computer teachers and randomly selected 200 secondary level students of Computer Studies subject. Questionnaire was

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taken as a tool for data collection. Three questionnaires, one for the principals, second for the computer science teachers and third for the secondary level students were developed to collect data. All the three questionnaires were discussed with the supervisor and experts and were validated by calculating Cronbach's Alpha reliability through Statistical Package for Social Sciences Version 12 (SPSS-12). The questionnaires were administered through self-approach. Weights were assigned to the responses and frequencies and percentages were calculated for item wise analysis. For testing the hypotheses about the students t-test was used whereas Mann Whitney U and Kruskal-Wallis (one way analysis of variance) were used to test the hypotheses about the teachers and principals. The results were interpreted accordingly. Main findings and conclusions were; Principals as well as teachers of both Boys' and Girls' schools were satisfied with the capacity of the computer laboratories, the furniture and the facility for the maintenance of computers. But there was lack of facilities like internet, stabilizers and UPS. Computer teachers in Boys' schools possessed sound academic and professional competence record as compared to Girls' schools. Principals of secondary schools superseded not only in academic and professional qualifications but also in their experiential back ground. The principals of both the sectors were quite satisfied with the teachers' performance. Course contents were relevant with the mental level of the students and need of the time. Majority of the students opted to study the subject of Computer Studies, because they were interested in it. Work load and the allocation of periods in the time table were satisfactory. School was not providing sufficient funds for the up gradation of computer laboratories. Principals, computer teachers and students of Girls' schools faced more problems and difficulties in managing and getting computer education at secondary level than Boys' schools.

KEY TERMS: Evaluation, Computer Studies, Secondary Schools

Introduction:

IbnMas`ood, radiallaahu `anhu, said, "True knowledge is not measured in relationship to how much you memorize and then narrate, but rather, true knowledge is an expression of piety [protecting oneself from what Allah prohibited and acting upon what He mandated]. "Also, "Study and act upon what you learn." The national education policy 2009 describes education as, "a vital investment in human and economic development and is influenced by the environment within which it exists. Changes in technology, labour market patterns and general global environment, all require policy responses. Traditions, culture and faith all reflect upon the education system and at the same time are also affected by them. The element of continuity and change remains perpetual and it is up to the society to determine its pace and direction (Govt. Of Pakistan, 2009).

Every technology has been the part of the learning domain in the history of civilization of the nations and this has been sustained through the process of transmission and renewal of experience from generation to generation. In the ancient period, the Mesopotamian, Egyptian and Bybolian civilization showed the same historical facts. The technology advancement in the different eras due to the unfading endeavors of Researches and their explorations bridges the theory and practice. The industrial revolution (1858) made the world of technology, dynamic, and its productivity attracted the attention of the educationists to bring revolutionary changes in the schools of today's.

Now in the modern age, the computer technology has widened the frontiers of knowledge. This great knowledge explosion has made an impressive effect upon the school climate and also has brought major changes to the triangle of educational components i.e. Teacher, learner and Curriculum.

The age of computer education in our country is too short and now is being introduced at different levels. It needs special attention for its dissemination for the synchronization of our education with the modern needs and trends. The Computer Education is an instrument for Pakistan to compete with the rest of the world for the propensity of opportunities and prosperity. The diffusion of technology into education is a crucial than technology investments in the country. Telecommunication has served the purpose of Information & Communication Technology (ICT) in the country which has participated in economic empowerment. It is suitable venue to establish ICT in every sector for development of the country (Sohaib, 2010).

The importance of the Computer education emphasizes on quality and determination of its objectives. This can be achieved through the holistic approach of evaluation. Operators of education at all levels need to constantly engage in such a process that systematically and objectively determine the relevance, effectiveness and impact of activities at these levels in the light of the stated objectives. Such a process is what is known as "Evaluation". The evaluation is simply defined as the systematic process of gathering, selecting, analyzing, and reporting valid information on the attainment of educational goals and objectives in order to facilitate correct adjudication on the effectiveness of teaching method(s) or an educational programme (Ben, 2006). No matter how good the teacher, no matter how gifted the pupil, no matter how effective the audio-visual aid, if no provision is made in a process by which the whole teacher-student interaction can be assessed, then the educational efforts may be seriously undermined (Nwana, 2002).

Therefore, it is obvious that no teaching process is complete without one form of evaluation or the other, as it helps the teacher and other stakeholders in determining the effectiveness of their teaching-learning process (Ochoche, 2008).

Statement of the Problem:

This study aimed to evaluate the effectiveness of the subject of Computer Studies in Secondary Schools.

Objectives of the Study:

i. General Purpose:

The purpose of the study is to make an evaluation of the subject of computer Studies in the secondary schools with a view to identify its strength and weakness and to suggest ways and means for the improvement of the subject.

ii. Specific Purpose:

To be more specific, the study will address the following questions:

1. To find out the level present status of the subject of Computer Studies in Secondary schools in respect of the objectives stated in the National Curriculum.
2. To evaluate the role of teachers, students, educational administrators and facilities provided for the teaching of Computer Studies in Secondary Schools.
3. To compare the standard of teaching of Computer Studies in Boys' and Girls' Schools.
4. Exploring the hurdles being faced in teaching of Computer Studies in Secondary Schools.

RESEARCH QUESTIONS:

The following hypotheses were made for the present research.

1. Is there no significant difference between the male and female secondary school teachers in their evaluation of computer education in the secondary schools.

2. Is there no significant difference between the most academically qualified (post graduate) and less academically qualified (graduate) secondary school teachers in their evaluation of computer education in secondary schools.
3. Is there no significant difference between the more professionally qualified and less professionally qualified secondary school teachers in their evaluation of computer education in secondary schools.
4. Is there no significant difference between the less experienced (less than 11 years) and more experienced (25 years and above) secondary school teachers in their evaluation of computer education in secondary schools.
5. Is there no significant difference between the Boys' and Girls' secondary school teachers in their evaluation of computer education in secondary schools.

Significance of the Study:

The Computer Studies is a recently introduced subject which has a great importance in the overall education of the student. It's not only as a subject is very important, but it can play an integral role in the overall performance of the students. The significance of the subject requires that a comprehensive study should be conducted over the effectiveness of the Computer Studies so that with the result of evaluation a better pedagogically taught and updated curriculum may be developed for the students.

REVIEW OF RELATED LITERATURE

Introduction

In the 20th century, many inventions revolutionized the world, but the most recent is computer. It has changed the society in all walks of life throughout the world. The present era is called as "the era of information and technology". According to Eisner (1988, p. 1) "We live in the information age, a time of computer terminals; bits and bytes; high-speed printouts; micros, minis, and mainframes; local area networks, pacman , spreadsheets, work stations, decision support system, data communications, data base management systems and much more." Due to the invention of computer everything is now on finger tips and the whole world has become a global village. As Jayaraman (1991, p l 8) described;

> The computer has become an integral part of everyday life, whether it is withdrawing money from an automatic teller machine, making airline reservations, estimating the stresses in an elastic beam, solving a set of nonlinear simultaneous equations, computing the orbital path of the space station, controlling machine in manufacturing, synthesizing music, writing a project report, or preparing the company's profit and loss statement, the computer is used. In fact, computers have become as ubiquitous as automobiles.

So, being the part of this global village, no country or society can ignore the computer literacy.

What is a Computer?

The computer is the new and sophisticated source of knowledge and information and is a strange and an important invention because of its two significant characteristics i.e. speed and accuracy. "The word computer comes from the word 'compute' which means to calculate. So, a computer is normally considered to be a calculating device that can perform arithmetic operations at enormous speed." (Sinha, 1997, p. I)

According to the Oxford dictionary, computer is "an automatic electronic machine for making rapid calculations or controlling operations that are expressible in numerical or logical terms." But the computer still works under the instructions of human's mind. It is automatic in processes and working but under the given instructions. Shami, Khalid, Shaukat, Javed and Khan (2006, p. 9) defines a computer as "An electronic device that executes the instruction in a program."

These definitions clearly categorize two major areas of computer application; data processing and computer assisted operations. It means that the computer processes the data to analyze and give results; and computer assisted operations are the uses of computer in different areas.

The industry, trade and business, defense, governance, education, etc. cannot run without a computer. According to Guruvadoo (2003, p. 2), "The International Technology Education Association focuses on industry trainers and vocational teachers and believes that schools should prepare students for the workforce, learning about technology as used in the 'real world' is essential." So, it is the need of the hour that every literate person should strive to be computer literate also.

History of Use of Computer in Education

The computer is a new invention in the sense that it is still the latest. According to Guruvadoo (2003, p.24),

> Use of the computer was started for instructional purpose in 1950 first time as a flight simulator to train pilots, Nine years later computer was used in public school in New York to teach elementary students binary arithmetic's, during the mid-seventies, large-scale projects in computer assisted instructions (CAI) on mainframe computers were available in schools, colleges and universities. In **QUESTIONNAIRE FOR COMPUTER TEACHERS**

1977, the first microcomputer was used in schools and became prevalent for the next two decades.

After this start new innovations in the use of computer in the field of education were made and new program for different use were developed.

2.7 Computers in Pakistani Perspective

In Pakistan right from the existence, technical and scientific education and adaptation of new technologies was stressed. This stress is expressed in every National Educational Policy. In Educational Policy (1979, p.89), it is stated, "New technologies, as determined from surveys will be introduced in the colleges and greater stress will be laid on the productive role of the technologies."

As computers are rapidly permeating every society, in Pakistan; it is also given necessary place in the educational policies. Policy statement of Educational policy (1992, p.67) was:

> Computer literacy and computer education will be emphasized and made a part of educational curricula at all levels. All training programs for teachers and educational administrators will include computer education as a compulsory component. Computer-aided instruction will be used as an important tool for enriching the teaching-learning process. Special funds will be provided for introducing computer hardware and software in schools. Science curricula will be designed so as to include computer-based creative educational activities.

2.8 Computers in Pakistani Schools

Government of Pakistan has introduced computer education at secondary level keeping in view the rapid development in the field of information technology at global level. Educational Policy 1998-2010 stressed and gave objectives regarding computer education in detail. Moreover in Education Sector Reforms (2001-06) also fixed targets to incorporate computer education in school education. All the provinces also initiated policy decisions to introduce computer education at school level.

As per the directions of Government of Pakistan, Ministry of Education Curriculum Wing Islamabad, all Boards of Intermediate and Secondary Education in Sindh issued notification explaining that computer studies is included in general science group in the scheme of studies of higher secondary level and for secondary level computer science is included in the compulsory science subjects against Biology. The detailed scheme of studies of computer science is given in the booklet titled 'Scheme of Studies, Syllabus and Model Question Papers' (2006, pp.24-26) published by all Boards of Intermediate and Secondary Education, Sindh.

2.9 Researches Regarding Problems in the Use of Computers in Education

Different researches were conducted in various parts of the world regarding use of computers in education. Scragg and Smith (1998, p.4) conducted a research on "Barriers to women in Undergraduate computer Science". Their major findings were; "Women enter with far less computing experience than do men, most women in our introductory courses never plan to major in computer science at all and lack of computer teachers is major barrier."

Poirot (1998, p. 103) conducted a research on "Computer education in the secondary schools: problems and solutions." He found major problems as: "three primary obstacles are faced by secondary school system wishing to implement computer curriculum. Recruiting teachers competent in computer science is a difficult problem; even the training of current teachers is difficult because of the scarcity of educational programs for teachers. Secondary level curriculum and computer hardware are two additional problem areas. With the curriculum becoming more readily available and with the microcomputer advancements being made, these problems are relatively minor compared to that of teacher preparation."

Toprakci (2007) conducted a study on "Obstacles at Integration of Schools into Information and Communication Technologies by taking into consideration the Opinions of the Teachers and

Principles of Primary and Secondary Schools." Main findings of the study were; "Insufficient training of school staff about ICT" and insufficient number of computers in the schools has been seen as serious obstacles. Another serious obstacle highlighted by the respondents was the shortage or slowness of system related to ICT in the schools. Limited educational software in the schools proved to be a serious obstacle for the integration of the ICT in schools. The low level of being open to changes, interest and drive of the directors of Ministry of Education and low level of being open to changes, interest and drive of the teachers and principals in the schools were also obstacles in the integration of ICT."

Cuban (2001) conducted a study on "High access and low use of technology in high school classrooms: explaining an apparent paradox". Evidence from interviews with teachers, students, and school staff, surveys, classroom observations, and school documents, pointed to the barriers; teachers do not have the time to find and evaluate software; computer training was seldom offered at convenient times; most training was too generic and was rarely specific to the needs of the teachers".

Guha (2000) carried out a study on "Are we all technically prepared? Teachers' perspective on the causes of comfort or discomfort in using computers at elementary grade teaching". The interviews of two groups, one as more comfortable with computers and other less comfortable, revealed that both groups believed computers could enhance student learning and all wanted to be competent in their use. The less comfortable teachers tended to prefer networked computers, while the more comfortable teachers preferred stand-alone machines. The less comfortable group mentioned workload and time management as barriers to implementing computers in classroom instruction."

Snoeyink and Ertmer (2001) using qualitative research methods within a case study framework, focused on incentives and barriers to using computer technology, and professional development approaches. Results indicated: participants' preferences for learning basic computer skills before integrating technology into the curriculum, the importance of seeing purpose in using computers in teaching, and having concrete and grade-specific integration ideas.

Yuen and Ma (2002) carried out a study on "Gender differences in teacher computer acceptance". A questionnaire was administered to 178 pre-service teachers, comprising of two independent variables (perceived usefulness and perceived ease of use), together with a dependent variable (intention to use). The results indicated that perceived usefulness and perceived ease of use directly affect the intention to use computers. Significant gender differences were also found: perceived usefulness will influence intention to use computers more strongly for females than males; perceived ease of use will influence intention to use computers more strongly for females than males; perceived ease of use will influence perceived usefulness more strongly for males than females.

Computer is a great invention of the 20n century. Due to this invention, the present age is rightly termed as the era of computer and information technology. In the last two decades, the application of computer in all walks of life has shrunk the distances and the whole world has become a global village. Now in the 2151 century, computer literacy has become a compulsion for every society. So, the introduction of computer studies in education has been initiated in schools in order to prepare the next generations for the challenges of the future. "The Internet burst on the scene in our society and in education only a few years ago, but quickly set fire to the interest and imagination of even the least technical teachers, students and parents" (Roblyer and Edwards, 2000, p. 208). In the field of education now, computer literacy is as basic as reading,

writing, and arithmetic. Computers can enhance thinking and change patterns of access to knowledge and it is easy to disseminate learning materials through computer. Teaching has become flexible in terms of the pace and location of learning. Computers with good instructional software can enhance academic learning time for science and other subjects also. Computer can help the students not only in knowledge acquisition but also in skill acquisition. Computer can enhance laboratory skills through simulations and bringing recorded experiences into the classrooms and also can help in assessment of performance. Drill and practice programs and computerized simulations make it possible to build interactive models of various science phenomena. Computers are not only used as teaching aid in the instruction but also do many tasks to help in managing all works regarding teaching learning process. Computer can help the students in individual study and also can be used in teaching to assist the instructional process. Computer also has become the source of knowledge as in the past the scholars, books and journals were.

In Pakistan right from the existence, technical and scientific education and adaptation of new technologies was stressed. This stress is expressed in all National Educational Policies. Government of Pakistan started to encourage private sector and civil society in the field of education during mid 90s for the development of education. In this regard education department and especially schools faced many problems and difficulties because a new setup for introduction of computer education was to be established.

Population

The study consisted of the following three populations:

Population I

The Principals of twenty secondary schools (10 Girls' Schools and 10Boys' schools), that were offering Computer Studies as a subject at secondary level.

Population II

The teachers who were teaching computer science at of twenty secondary schools (10 Girls' Schools and 10 Boys' schools), that were offering Computer Studies as a subject at secondary level.

Sampling

To select a representative sample out of the population the steps were taken as Gay, (2000, p. 125) described:

i. For smaller populations, say N=100 or fewer, there is little point in sampling; survey the entire population.
ii. If the population size is around 500, sample should be 50%.
iii. If the population size is around 1500, sample should be 20%.

The following steps were taken to select representative samples from the three populations:

i. All the principals of twenty secondary schools, which were offering Computer Studies as a subject at secondary level, were taken as sample.
ii. All the twenty computer teachers (one of each secondary school), were selected as sample from the twenty secondary schools, offering Computer Studies as a subject at secondary level.

iii. Ten students of Computer Studies were selected randomly by using fishbowl method of random selection, from each secondary school as sample on equal allocation basis. School wise detail of enrolment of computer science students and number of randomly selected students is given in Appendix A. Detail of population and sample is given in Table 3.1 as follows:

Table 3.1: Detail of Population and Sample

S.No	Respondents	Population	Sample
1	Principals	20	20
2	Computer Studies Teachers	20	20

Design of the Study

The research was descriptive in nature and survey technique was adopted for this study.

Tools for Data Collection

Questionnaire as a tool for data collection was preferred for all the three populations because the respondents, selected for the study were educated. It was convenient for them to respond freely. Questionnaires were developed to collect data from the respondents of the selected secondary schools.

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

The data collected through three questionnaires were analyzed. Questionnaires were administered through self-approach and rate of return was 100 percent. Analysis of the responses of Principals and Computer Teachers are presented in tables separately as follows:

GRAPHICAL DATA ON THE RESPONSE OF PRINCPALS

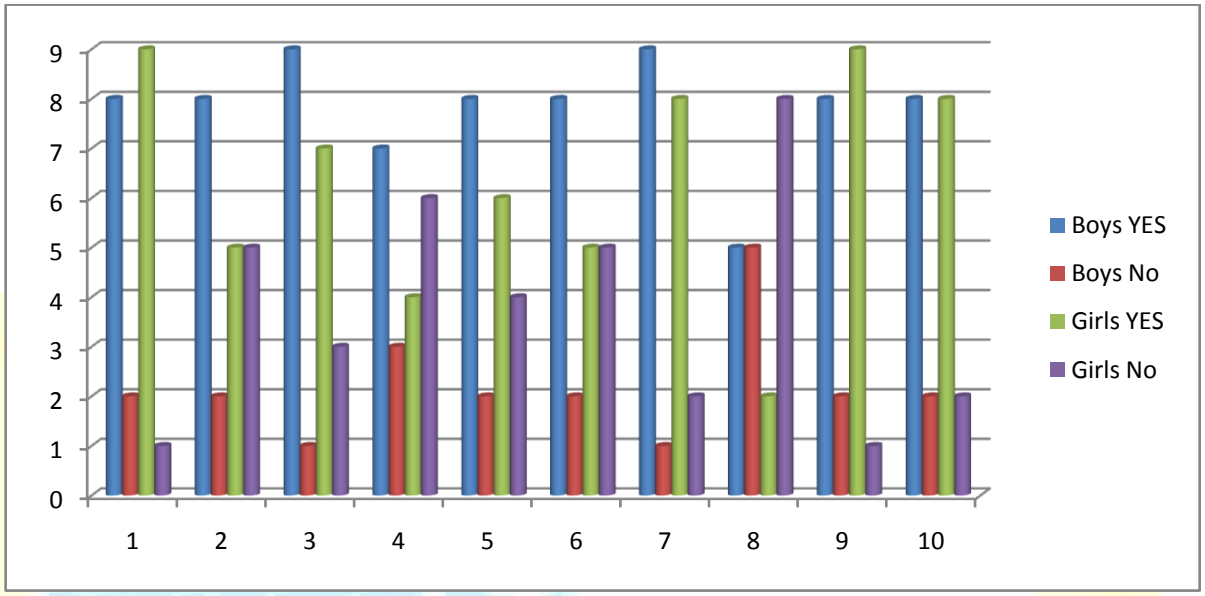
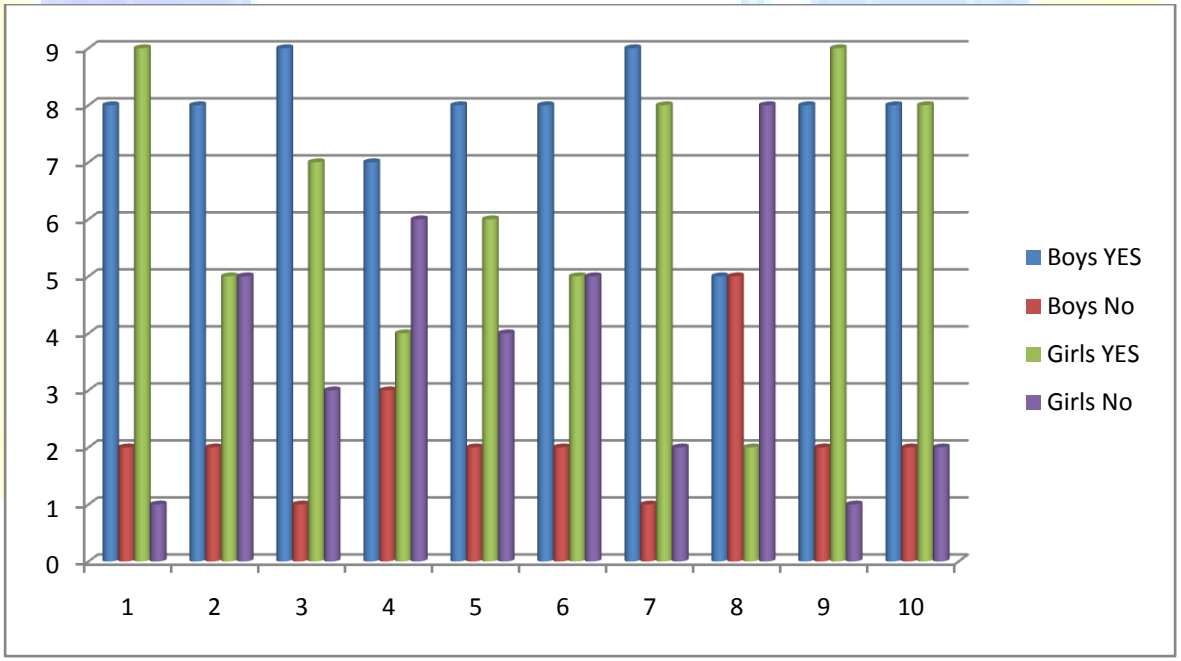


CHART ON THE REPLIES OF COMPUTER TEACHERS



Conclusions

Following conclusions were drawn on the basis of findings and data analysis:

Conclusions from Principals' Findings

I. Principals of Girls' schools superseded not only in academic and professional qualifications but also in their experiential background.

II. Vast majority of principals of Boys' schools and majority of principals of Girls' schools were satisfied with the capacity, furniture, maintenance of computers and other physical facilities provided for computer classes.

III. According to the principals of both sectors, there existed reasonable compatibilities among computer teachers, their teaching methodologies, and interest in teaching computer science subject, work load and involvement of students in teaching learning situation.

IV. Principals of Girls' schools encountered more problems and difficulties in managing computer studies in general as compared to the principals' of Boys' schools. But the problems and difficulties faced by principals (Girls' and Boys') remain the same irrespective of the difference in gender, academic and professional expertise or the length of service.

V. Cooperation extended by education department for the teaching of computer science was appreciated to some extent. But Government was not providing sufficient funds for computer education program. Principals (both Girls' and Boys') were just satisfied with the evaluation procedure of Examination Board.

VI. Girls' schools were in general deprived of relevant reading material for the subject of computer science other than textbooks as compared to Boys' schools. But appropriate

number of periods was allocated for computer studies in both Girls' and Boys' schools.

Conclusions from Computer Teachers' Findings

I. Incompatibilities existed in Girls' and Boys' schools are regarding teachers' academic and professional qualifications, while job status, salary package and service cadre were almost the same.

II. Computer teachers in Boys' schools were well qualified as compared to Girls' schools. A high percentage of Boys' school teachers and hundred percent of Girls' school teachers were recruited on contract bases. Computer teachers in both sectors were not satisfied with the prevailing salary packages and strongly agreed with the proposal for special allowance for the teaching of computer subject. Moreover a vast majority of teachers in both sectors wanted to have separate service cadre for them.

III. Computer teachers (Girls' and Boys') were satisfied with the space, furniture, teaching aids, maintenance facilities of software in the computer laboratories. While Girls' school teachers in general were not satisfied with the maintenance facilities of hardware. Moreover laboratory assistants for computer laboratory were not available in both Girls' and Boys' sectors.

IV. In Boys' schools, the availability of printer, stabilizer, UPS and Internet was quite ensured as compared to Girls' schools. But the stationary supply in computer laboratories was not up to the mark in both sectors.

V. In the light of teachers' opinion of both sectors, evaluative procedures for computer studies were appropriate. While allocation of periods (both for theory and practical) in the

time table of both schools were suitable, however taking computer science classes in the early periods of the day was desirable.

VI. Computer teachers of both Girls' and Boys' schools agreed that course content was relevant to the students' mental level and need of the hour.

VII. Computer teachers in Girls' schools encountered more problems and difficulties in providing computer education in general as compared to Boys' school computer teachers. But the problems and difficulties faced by computer teachers (Girls' and Boys') remain the same irrespective of the difference in gender, academic and computer qualifications and professional expertise.

General Conclusions

1. Principals as well as teachers of both and Girls' and Boys' schools were satisfied with the capacity of the computer laboratories. In their opinion, the furniture and the facility for the maintenance of computers were both up to the mark. However, most of the Boys' and Girls' schools were lacking the facilities like internet, stabilizers for voltage fluctuation and UPS (un-interruptible power supply)

2. Computer teachers in Boys' schools possessed sound academic and professional competence record as compared to Girls' schools. However, the teachers in both schools facilitated effective learning among students and the principals were quite satisfied with the teachers' performance. Moreover, principals of Girls' schools superseded not only in academic and professional qualifications but also in their experiential background.

3. In Boys' sector both principals and teachers were satisfied with the relevancy of course contents as well as with the reading materials while in Girls' sector, both the

principals and teachers complained about the non-availability and relevancy of reading material.

4. Majority of the students opted to study the subject of computer science, because they were interested to learn about computers and students' interest in studying computer was on the rise.

5. Both in Girls' and Boys' schools, majority of principals and teachers showed their contentment as far as the working load and the allocation of periods in the time table were concerned. But the teachers wanted to take these periods in the early hours of schools

6. Government was not providing sufficient funds for the up gradation of computer laboratories.

7. Overall principals, computer teachers and students of Girls' schools faced more problems and difficulties in managing and getting computer education at secondary level than Boys' schools. However, there was no significant difference about facing problems and difficulties in introducing computer education irrespective of their gender, academic and professional qualification and length of job experience among principals and computer teachers.

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