PROBLEMS AND PROSPECTS OF IT INSTRUCTION AND EXAMINATION AT SECONDARY LEVEL UNDER THE  
 IT @ SCHOOL PROJECT OF KERALA

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**2015**

**DECLARATION**

I, SUKANYA RANI, P.do hereby declare that this dissertation, "**PROBLEMS AND PROSPECTS OF IT INSTRUCTION AND EXAMINATION AT SECONDARY LEVEL UNDER THE IT @ SCHOOL PROJECT OF KERALA**” has not been submitted by me the award of any Degree, Diploma, Title or Recognition before.

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**CERTIFICATE**

I,Dr. Mohamed Saleem, do here by certify that this dissertation,**“PROBLEMS AND PROSPECTS OF IT INSTRUCTION AND EXAMINATION AT SECONDARY LEVEL UNDER THE IT @ SCHOOL PROJECT OF KERALA”** is a record of bonafide study and research carried out by **SUKANYA RANI.P**, under my supervision and guidance.

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**CONTENTS**

**LIST OF TABLES**

**LIST OF FIGURES**

**LIST OF APPENDICES**

|  |  |  |
| --- | --- | --- |
| Chapter | Title | Page No. |
| I | **INTRODUCTION** | 1 – 16 |
| II | **REVIEW OF RELATED LITERATURE** | 17 – 48 |
| III | **METHODOLOGY** | 49 – 60 |
| IV | **ANALYSIS AND INTERPRETATION** | 61 – 88 |
| V | **SUMMARY, FINDINGS, CONCLUSIONS& SUGGESTIONS** | 89 – 99 |
|  | **BIBLIOGRAPHY** | 100 – 106 |
|  | **APPENDICES** |  |

**LIST OF TABLES**

|  |  |  |
| --- | --- | --- |
| **Table No** | **Title** | **Page No** |
| 1 | Breakup of the final sample | 59 |
| 2 | Responses of the teachers regarding process and procedure in IT instruction. | 64 |
| 3 | Responses of the teachers regarding strength and limitation of IT instruction. | 67 |
| 4 | Responses of teachers about the Challenges of IT instruction. | 69 |
| 5 | Responses of teachers regarding process and procedure of IT examination. | 73 |
| 6 | Responses of teachers regarding the strength and limitation of IT examination. | 75 |
| 7 | Responses of teachers regarding the challenges in IT examination. | 76 |
| 8 | Responses of students regarding process and procedure of IT instruction. | 78 |
| 9 | Responses of the students regarding the strength and limitation of IT instruction. | 80 |
| 10 | Responses of students about the challenges of IT instruction. | 82 |
| 11 | Responses of students regarding process and procedure of IT examination. | 84 |
| 12 | Responses of students regarding the strength and limitation of IT examination. | 86 |
| 13 | Responses of students regarding the challenges in IT examination. | 87 |

**LIST OF APPENDICES**

|  |  |
| --- | --- |
| Appendix No | Title |
| I | Questionnaire on secondary School IT instruction and soft exam for teachers (English Version). |
| II | Questionnaire on secondary School IT instruction and soft exam for teachers (Malayalam Version). |
| III | Questionnaire on secondary School IT instruction and soft exam for students (English Version). |
| IV | Questionnaire on secondary School IT instruction and soft exam for students (Malayalam Version). |
| V | Questionnaire on secondary School IT instruction and soft exam for students – Response sheet. |

**CHAPTER I**

INTRODUCTION

* **Need and Significance of the Study**
* **Statement of the Problem**
* **Definitions of Key Terms**
* **Objectives of the Study**
* **Design of the Study**
* **Scope and limitations**
* **Organizations of the Report**

Education is the process of facilitating learning. Knowledge, skills, values, beliefs and habits of a group of people are transferred to other group through teaching, training and research. Education is the high way to that goal. The National Policy of Education, 1964-66 marked a significant step in the history of post independent education. It’s aimed to promote national progress, a sense of common citizenship and culture and to strengthen national integration. It laid stress on the need for a radical reconstruction of the education system, to improve its quality at all stages and gave much greater attention to science and technology. Teaching is a unique professional human activity, in which teachers creativity and imaginatively use their knowledge to promote the teaching and learning. How teaching is conducted has a strong impact on students’ abilities and skills to educate themselves. Successful teachers present powerful cognitive and social task to their students and teach the students how to make productive use of them.

Off course this is an age of information technology. The devolvement information communication technology has been instrumental in bringing efficiency improvement and perfection in process and product of educational endeavor. In the case of teaching and learning, information technology become a catalyst to make the educational process more comprehensive and simple to help to generate more information in a lesser time and more over it help students and teachers for better interaction and communication. Information Technology also helps in the development, application and evaluation of systems and techniques in the field of teaching and learning IT as a subject of study. It has a predominant impact on teaching and learning of the entire subject of the study.

The 21st century is the age of IT. A remarkable trend in the field of education during the last decades all over the globe has been the use of ICT in making education productive giving instruction a more powerful and scientific base extending the educational opportunities to the masses and creating an new learning environment and information rich society. The modes of teaching and curriculums are changing in many times from the beginning to till now. A sudden change in the education is happened with the introduction of Information Technology (IT). The motivation of information technology is to shift traditional education system into an advanced level with maximum utilization of the technology. E-Learning, Course Management Systems (CMS) and finally Massive Open Online Course (MOOC) are the major byproducts of these technological advancements. Education research and all its aspects are now seriously looking in to the implementation and advancements in the Information and Communication Technology (ICT). The academic society is curiously searching and applying the information and communication technology tools in a large way around the preschool to the top level research society.

School computing began in India in the early 80’s. It gained momentum with pilot project Computer Literacy and Studies in Schools (CLASS) launched by Government of India. The objective of the project detailed in the report of a National workshop (NCERT,1984)were to provide student with a broad understanding of computer and their use ,familiarize students with the range of computer application in all walks of human life and the potential of the computer as an information processing tool. NPE (1986) suggested that the computers are fast becoming available to schools and training in its use should be a part of education, especially professional (teacher) education.In Kerala also technology becomes the integral part of the education while both teaching and learning. Traditional class rooms are shifted into advanced smart class rooms with ICT tools like computer, projector and other smart devices, networking hardware’s and the smarter application software’s which supporting the process of smart teaching and learning. As a part of the technological improvements, all government/aided schools are introduced IT as a special subject in their curriculum from 2002. Specialized software’s are developed for the purpose of conducting exams on the subject IT and both theory and practical exams are conducted effectively from 2005. In 2012-2013 all the written exams on the IT is stopped and complete computerized theory and practical exams are conducting. The theory paper included multiple choice, very short answer and short answer questions. The software is developed a special project of the government of Kerala, called IT @ School.

NCERT (2001) has brought out curriculum guide and syllabus for IT in schools within framework of education. Government of Kerala has to introduce computer education to all Secondary school and higher secondary schools. Department of Education Technology of the SCERT aims to develop a common vision of Educational Technology and its functioning in the Kerala context with the help of expert in field of IT. It provides technological support to other department of the SCERT, DIET is now working in association with a new project named IT @ School Project. For IT @ School Project a vision document prepared by the state appointed task force headed by Prof. U.R.Rao in the year 2000.

IT @ school project in Kerala, launched in 2001. It is a remodeled traditional teaching methodologies in class room through the use of information technology. IT @ school project is an information technology project under the department of General education, Govt. of Kerala, in India. The project is now been implemented from 5th to 12th standard in the state covering as many as 12000 schools and also in schools Mahe and Lakshadweep and the middle east. The work of the project saw 4 million students and 2 million teachers empowered in ICT through a network of dedicated 200 master trainers and 5600 IT coordinators (SITC) in the state, who are school teachers who are selected, based on this interest in learning and teaching ICT enabled education. The project is termed as single largest simultaneous deployment of free and open source software (FOSS) based ICT education in the world.

IT @ School is also the nodal agency for implementing EDUSAT network and runs an exclusive channel for education called VICTERS (Versatile ICT Enabled Resource for Students), which is now aired for 17 hours a day- from 6 am to 11 pm. India's epoch making first broadband network on EDUSAT for schools, "VICTERS" inaugurated by [A P J Abdul Kalam](https://en.wikipedia.org/wiki/A_P_J_Abdul_Kalam) the President of India on 28 July 2005 in Thiruvananthapuram. VICTERS offers interactive virtual classrooms that enable the school students as well as the teachers to directly communicate with the subject experts and educationists. It also ensures the dissemination of high quality education to the students and teachers from the original source. Various programmes telecast through VICTERS are like examination oriented programme for SSLC and Plus 2 level, Ormayile Malayalam ( Specific date wise regional programme), Pusthakangalkkoppam (Introducing various Books), Haritha Vidhyalayam (Educational reality show for schools), Kadhaparayum Neram (Story telling time), etc.

The other activities of IT @ School Project consists, ICT training; Training given to familiarize the basics of Operating Systems and office packages and other application software. Hardware Training: 3 day training programme on hardware maintenance and basic support. Internet Training; This 20 hour training programme was given to all SITCs and interested school teachers. The trained SITC then train all High School teachers in their school. Government has also issued strict instructions that every student in Std X in the school should get at least 10 hours of internet exposure per year. IT Training for the Visually challenged; In association with Insight scheme of Kerala State IT Mission, the Project has successfully imparted IT training using free software for teachers of special schools for visually challenged, by exclusively using free software based screen reading software named ORCA. Camera handling training; Two day training on camera handling was given to the teachers, enabling them to create educational videos which could be beneficial in implementing ICT enabled education. Training on ICT enabled content; Specific training on ICT enabled content was provided to teachers so as to enable them to use ICT enabled content in all subjects in order to equal teachers in classroom transaction.

**Need and Significance of the Study**

Science and Technology has always being instrumental in bringing efficiency and improvement in the process and product and human work. The educational system is also been influenced by the increased use of Technology. It has provided valuable help in improving the task of the teacher, the process of teaching-learning and enhancing and enriching the goals of education.

For children, computer technology has provided an indescribable wealth of resources, information and knowledge; since the introduction of the internet, students are now able to access information on whatever subject they want, wherever they want. Resources include journals, articles, e-books, practice tests and examinations, model answers and research findings. Research has also suggested that computer technology has helped students to improve their grades in other subjects, most notably science. Practically, students can work much faster using a computer which enables them to do more study in the same period of time.

Computer technology has enabled teachers to make their lessons more interactive and therefore more interesting and rewarding; this method has also been shown to improve pupil performance as lessons are more memorable and therefore students are able to retain information more effectively. Teachers, like students, can also find a whole host of resources on the internet which can provide inspiration and advice for classes; teachers are also able to recommend good resources to student to further encourage and stimulate their learning.

In the era of technology. IT aids plenty of resources to enhance the teaching skills and learning ability. With the help of IT now it is easy to provide audio visual education. The learning resources are being widens and widen. Now with this vivid and vast technique as part of the IT curriculum, learners are encouraged to regard computers as tools to be used in all aspects of their studies. In particular, they need to make use of the new multimedia technologies to communicate ideas, describe projects, and order information in their work.

IT has provided immediacy to education. Now in the year of computers and web networks the pace of imparting knowledge is very fast one can be educated anywhere at any time. New IT has often been introduced into well-established patterns of working and living without radically altering them. For example, the traditional office, with secretaries working at keyboards and notes being written on paper and manually exchanged, has remained remarkably stable, even if personal computers have replaced typewriters.

IT has made it easy to study as well as teach in groups or in clusters. With online we can be unite together to do the desired task. Efficient postal systems, the telephone (fixed and mobile), and various recording and playback systems based on computer technology all have a part to play in educational broadcasting in the new millennium. The Internet and its Web sites are now familiar to many children in developed countries and among educational elites elsewhere, but it remains of little significance to very many more, who lack the most basic means for subsistence.

Audio-Visual Education, planning, preparation, and use of devices and materials that involve sight, sound, or both, for educational purposes. Among the devices used are still and motion pictures, filmstrips, television, transparencies, audiotapes, records, teaching machines, computers, and videodiscs. The growth of audio-visual education has reflected developments in both technology and learning theory.

Studies in the psychology of learning suggest that the use of audio-visuals in education has several advantages. All learning is based on perception, the process by which the senses gain information from the environment. The higher processes of memory and concept formation cannot occur without prior perception. People can attend to only a limited amount of information at a time; their selection and perception of information is influenced by past experiences. Researchers have found that, other conditions being equal, more information is taken in if it is received simultaneously in two modalities (vision and hearing, for example) rather than in a single modality. Furthermore, learning is enhanced when material is organized and that organization is evident to the student.

These findings suggest the value of audio-visuals in the educational process. They can facilitate perception of the most important features, can be carefully organized, and can require the student to use more than one modality.

The information and data which are available on the net is purely correct and up to date. Internet, a collection of computer networks that operate to common standards and enable the computers and the programs they run to communicate directly provides true and correct information.

Internets support thousands of different kinds of operational and experimental services one of which is online library. We can get plenty of data on this online library.

As part of the IT curriculum, learners are encouraged to regard computers as tools to be used in all aspects of their studies. In particular, they need to make use of the new multimedia technologies to communicate ideas, describe projects, and order information in their work. This requires them to select the medium best suited to conveying their message, to structure information in a hierarchical manner, and to link together information to produce a multidimensional document.

The integration of information technology in teaching is a central matter in ensuring quality in the educational system. There are two equally important reasons for integrating information technology in teaching. Pupils must become familiar with the use of information technology, since all jobs in the society of the future will be dependent on it, and information technology must be used in teaching in order to improve its quality and make it more effective.

The whole IT instructional processes of school are now controlled by IT @School project. Which include, preparation of text book, training teachers, conduct of IT exam etc. The examination in IT including SSLC public exam is on the basis of software developed by IT@ school project. This soft based examination launched our state during the academic year 2004-2005.

Thus since 2005 the software based examination have been conducting both for VIII, IX and Xth standard. So far no attempt has been made to evaluate the process and functions of this examination programme. Still teachers and students are pointing so many problems with regard to this examination process. Both the sixth survey of educational research (1993-2000) realizes that then less studies in the class of IT enabled education. Hence it is highly significant to conduct an evaluation study on IT instruction and examination of secondary schools. The investigator hopes that the results of the study will be a guideline for enriching the process and procedure of the IT instruction and examination in our secondary school.

Among all the IT activities in secondary schools, the evaluation part of the organization and functions of secondary school IT instruction and examination is consider a serious challenge. This study proposes a methodology to effectively evaluate all the above mentioned aspects of IT.

**Statement of the Problem**

The problem for the present study is entitled **as “**Problems and prospects of IT instruction and examination at secondary level under the IT @ school project of Kerala”.

**Definition of Key Terms**

Problems and prospects: For the present study the term Problems and prospects means, the major difficulties faced by teachers and students and future aspects of teaching and learning with regard to IT subject in Secondary Schools.

Secondary school: Secondary school means the schools imparting education from 8th to 10th standard.

Instruction and examination: Instruction and examination means the mode of transaction of curriculum with regard to IT content and the examination conducted both in the form of theory and practical based on software developed by IT @ school project.

**Objectives of the Study**

The major objectives of the study are as follows:

* To identify the problems and challenges faced by the teachers and students in the IT instruction and examination at secondary school level.
* To analyse the process and procedures of IT instruction and Examination at secondary level conducted by IT @ school project of Kerala.
* To identify the major strength and limitations of IT instruction and examination at secondary level.
* To suggest better strategies for improving the overall quality of IT instruction and examination at secondary schools of Kerala.

**Methodology**

The present study is an attempt to analyse the problems and prospects of IT instruction and examination at secondary level. In order to fulfill the objectives, the investigator followed descriptive survey method as the design of the study.

**Sample used for the study**

The present study was conducted on a representative sample of 204 teachers and 534 students. Proper representations were given to the relevant categories such as gender and type of management. Stratified random sampling technique is used for the selection of sample.

**Tools employed for the study**

In order to fulfill the said objectives following tools were used for collecting data:

* Questionnaire on IT instruction and soft examination for secondary school teachers (Sukanya and Saleem 2015).
* Questionnaire on secondary school IT instruction and soft examination for secondary school students (Sukanya and Saleem 2015).

**Statistical technique used in the study**

Percentage analyses were used to analyse the collected data and interpretation of results.

**Scope and Limitations of the Study**

The present study is to analyse the problems and prospects of IT instruction and examination at secondary school level. The investigator find out the teacher’s perspective and student’s perspective of IT instruction and examination .This findings of the study will help not only students and teachers but also educational planners and administers for the improvement not IT enabled instruction in schools. Thus, in the present scenario an assessment about the implementation of IT @ school project and process and procedure for instruction and examination, which possess a large vision is essential. This add to the greater scope of the study.

Through the investigator gave due representation to sample, methods etc. Certain limitations have been crept in to the study. They are numbered as follows

* The IT@ school project has been implemented in Kerala as a whole, but only two districts Kozhikode and Malappuram is taken under consideration
* While selecting type of management of schools, government and aided schools are given due importance, unaided schools are avoided
* Questionnaire have been employed for teachers and students only

Practical constraints are the justification for the above limitations, investigator has attempted to make the data as objective and valid as possible and hopes that the findings of the study will yield fruitful results. This humble study would be a guideline for the stake holders and practice strategies for the qualitative improvement of IT education in secondary schools of Kerala State in general and Kozhikode and Malappuram district in particular.

**Organisation of the Report**

This report of the study was presented in five chapters, the details are given below.

**Chapter I: Introduction**

This chapter presents a brief introduction of the problem, need and significance, statement of the problem, objectives, design of the study and scope and limitations.

**Chapter II: Theoretical overview and review of related studies**

In this chapter theoretical over view of IT @ school project and brief history of IT education in Kerala is restated. This chapter also presents the abstracts of reviewed related literature including journals, books, studies and technical reports.

**Chapter III: Methodology**

Methodology of the study described under heading like objectives, tools, sample, data collection procedures, scoring and statistical technique used for collection of data.

**Chapter IV: Analysis and Interpretation of data**

Details of analysis, interpretation of the results and its discussion presented here in this chapter.

**Chapter V: Summery, findings, conclusions and suggestions**

This chapter includes summery of the study retrospect, major findings, educational implications of the study and suggestions for further research.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE**

* **Theoretical Overview**
* **Review of Related Studies**

**REVIEW OF RELATED LITERATURE**

Review of related literature has an important role in research. A research work is not meaningful without a thorough review of the related works. This process will help to frame and focus the research question and move closer to the hypothesis. The literature review is a good chance to learn what is known and what is unknown about the topic .An effective research is based upon past knowledge. Only knowledge of past will help us to equip for the present. Writing a literature review let the researcher to gain knowledge in the area of the topic .This will help the researcher to critically review the various aspects of topic and frame the strategies for further steps in the present study.

Turney and Robb (1970), says that, "Interpretation of a problem, development of research design and determination of the size and scope of the problem, all depend to a great extent on the care and intensity with which a researcher has examined the literature related to the extent”.

Best and Kahn (2002), observes “Familiarity with the literature in any problem area helps the student to discover what is already known, what others have attempted to find out, what method of attacks have been promising and what problem remain to be unsolved”.

The present study is an attempt to review the problems and prospects of IT instruction and examination of secondary schools. A brief review of related literature in this area is summarized under following heads.

* **Theoretical Overview**
* **Related Studies**

**Theoretical Overview**

The present century isrightly called the “Technological Century”. New trends in education have also come about and new challenges have been thrown up to reckon with. At the same time there is an indisputable need to maintain continuity, change and growth. Society has been credited with creating technology, but technology is simultaneously creating society. These observations would also suggest the technologist beginning to exercise a benevolent tyranny over humankind.

Information technology or IT describes any technology that powers or end the storage, processing and information flow within an organization. People use the term generically when referring to various kinds of computer related work, which sometimes confused their meaning.

Information technology need to be effectively integrated in to formal class room teaching and learning conditions. IT is fundamentally aimed at improving the efficiency of educational system by increasing the rate depth, precision and the value of the learning when takes place. A quick view on nature of IT reveals that IT laid stress on the development of methods and techniques, organization of learning situation, designing and measuring instruments for testing learning out comes.

The information and communication technology system can revolutionize the life of the society. Information when proceed gets converted in to knowledge. Knowledge is power in modern intellectual society, which leads to wisdom, bring in prosperity, creativity and best of health, plenty of wealth and enjoyable life. Efficient utilization of existing knowledge can create comprehensive wealth for the nation in the form of better health, education, infrastructure etc. for improving quality of life Kalam (2004).

The use of information and communication technologies in institutions especially in school levels will have great impact in teaching and learning process there by solving many educational problems such as wastage and stagnation mass failure of students, delinquency and truancy.

The teacher has a key role in the introduction of technology in class room and in its successful adoption and application. During 20th century there have been many attempts to penetrate schools with various technological innovations include overhead projection (OHP), teaching machine and computers. Teachers decision regarding the use of computer in class rooms are affected by their instructional style, flexibility in adopting new situation attitude towards computers, length of experience in using computer in their own lesson the their self-perception as computer user (Collis, 1988). Ninth five year plan (1997-2002) has envisaged the utilization of information technology in education. As a result of which in Kerala, IT @School Project came in to existence.

IT @ school is a project under the directorate of public instruction of the government of Kerala, which introduce information Technology in High School education for qualitative improvement of the conventional teaching/learning system. IT @ school project able to use initializing changes in teaching, learning and administration in the general educational sector.

Integrating the three aspects of computer education, viz. computer as a subject, computer as a teaching learning tool and computer as a work tool, IT @ school project aims at putting computer at the disposal of teachers and students to ensure the enhancement and achievement of educational goals. National level organizations like Central Institute of Educational Technology (CIET), National Council for Educational Research and Training (NCERT), Indira Gandhi National Open University and state level organizations like State Institute of Educational Technology (SIET) will play a proactive role in developing and sharing of digital content. It would help the teachers to execute their roles in the best way possible. These possibilities could be utilized in school administration, planning learning activities and evaluation. The IT @ school project in Kerala launched ten years ago, the vision document prepared by the state appointed task force headed by Prof. U. R. Rao in the year 2000, has remodeled conventional teaching methodologies in classrooms through the use of Information Technology. They assessed the states of the present educational system, future trends, introduction of IT as a part of curriculum and realization of a knowledge based society by 2010. Task group opined that the goal of IT in education is not to produce software programs but to create a new generation of thinkers, professionals, scientists, technologists who will be able to use any relevant information using IT as a tool.

IT@ school project fundamentally aims to empower teachers by making them proficient in information technology to use it as “potential instructional and reference tool “and to introduce the technology in the class rooms as an effective tool to learn deeper, better and faster. The general education department of government of Kerala, which was setup in the years 2000 for empowering the state school populace by imparting information communication technology (IT) enabled the project has achieved several milestones in implementing ICT enabled education in over 12000 schools in the state, including enhancing the intellectual productivity of teacher and the curriculum comprehension of students.

Information Technology (IT) adoption was at its early phased in Kerala during 2000 end consequently most of the teaching community had very little IT skills. Hence the recommendation of the committee was to introduce IT in to Kerala school education initially at the high school level (Std VII to X). In November 2000 the minister for education, Department of information and public relation, Government of Kerala accepting the report “IT in education, vision 2010” announced that the project would be implemented in phases and in the first phases about 10000 teachers would be made computer literate. The next phase was to introduce IT in the school curriculum by 2002. The full integration of IT for teaching and learning was planned for 2010 and it was hoped that the school going children at all level would have access to computers and internet connection.

The back bone of the project is its strong network of two hundred master trainers and five thousand six hundred school IT co coordinators (SITC) in the state, who are hand-picked school teacher who are selected, based on their interest in learning and teaching ICT enabled education. Through elaborative capacity building processes, the project aim to empower the existing teachers in school to use the various facts in information and communication technology as an educational tool. As on date, as many as two lacks teachers have been given training as part of the project initiatives. The initial year the project focused more to words imparting various IT based training programs based on IT now the scope has elaborated to enable them to handle their subject using ICT as a tool.

The IT @ school program is fully integrated in to the existing educational processes it relies on the elaborate teachers training structures with the public education system in Kerala to train the school teachers on using ICTs both in terms of IT learning and ICT enabled learning. There are a set of masters trainers and acquire sufficient expertise in using computers. Since these trainers are themselves teacher educators.

The main objective of the IT @ school projects are capacity building, infrastructure deployment at school, content development delivery mechanism and satellite based learning system. The project contains three phases namely

Phase I. IT Education (teaching software and hardware aspects and programming)

Phase 2. IT enabled education provides instructor with freedom and flexibility to adopt IT in enhancing the delivery of their own courses and to increase learning effectiveness

Phase 3. ICT embedded education where all education where all education delivery is done based on IT with multiple touch points ranging from classroom technologies to instructional design and delivery

**Phase 1. A bottom up approach**

IT introduced as an optional subject for standard 8 in year 2002 on a pilot mode .Subsequently it become a compulsory subject in standard 8, 9 and 10 year and by 2004, IT is made a compulsory in standard in 9 and 10. Hard ware requirements include setting up of a computer lab and in schools .Computer to student ratio to be maintained maximum up to 1:5 .Theory to be handled by trained teachers, practical’s by PTA appointed lab instructors. Time allowed is 8 hours per day for 18 divisions’ i.e. 900 students maximum. Soft ware requirements includes providing IT text book for 8th standard, teachers hand book on multimedia, a supplementary it text book, multimedia presentation CDs and basic software packages. Other activities of this phase includes 100% IT literacy campaign, association with project IKM (Information Kerala Mission ) incentives for industries to associate with project, generation of employment and up gradation of skills ,increasing governmental assistance to the project.

**Phase 2. IT Enabled education**

ICT enabled education started in 2010 on ‘close to completion ‘of the first phase ‘IT education’. Students performance in completion like painting using computers, and creating multimedia presentations conducted regularly at local district and state level improved. Students who have computers at home started installing free software and contributing to localized content development.

Revising the curriculum of other subjects and incorporate IT component. Use IT as a teaching tool in all schools. Smart classroom has introduced in this phase. Empower the teachers to use educational applications developed.

**Phase 3. IT embedded education**

In this phases it includes giving broad band connection to all schools, internet training to all teachers, hardware training to schools IT coordinators. Teachers were given ICT training and ICT enabled training and specific training was given to subject teachers to teach their subjects with the help of ICT. Empowering the existing teachers in school to use the various faces of ICT as an educational tool and to build up the capacity for critical thinking and students trained in hardware issues during hardware clinic which boosted their confidence to handle the common technical problem found in school ICT hardware. It includes giving broad band internet connection to all schools ,internet training to all teachers ,hard ware training to school IT coordinators, empowering the existing teachers in schools to use the various facets of ICT as an educational tool to bring in a shift from passive learning and rote memorization to methods that foster children capacity for critical thinking and their ability to learn on their own, equip all schools to have the basic equipment’s and familiarize the issues associated with the maintenance and to substantiate teaching learning process through the use of ICT tool.

The key component of IT @ schools are Employment of free and open source software, infrastructural development, capacity building and content development

**Capacity building process**,

The project aims to empower the existing teachers in school to use the various facets of information and communication technology as an educational tool. Hardware clinic, program launched for the maintenance, repair and upgrading of damaged or low configuration computers in schools. Teachers and students trained in Hardware issues during Hardware clinic, which boosted their confidence to handle the common technical problems found in school ICT hard ware.

**Content development,**

IT@ school project has several programs which included in the development of its own operating system. IT @ school EDU-UBUNTU is now being used in all the schools in the state. The project has also prepared interactive multimedia CDs, hand books and training modules for ICT as well as Textbooks for IT in standard 5 to 10. All the content developed by the project is strictly as per the new curriculum approach (NCF).To add with this the project had developed E textbooks for standard 8 to 10 .School IT Fest, IT awards to schools etc. are other programs for motivating schools. IT @school is the nodal for e-governance activities in General Education Department and implemented several e-governance programmers like electrification of all class rooms to fuel ICT enabled education .Textbook distribution computerization ,transfer and posting computerization, single window system for plus one admission etc. IT @school project runs an exclusively educational channel called VICTERS (virtual classroom technology on Edusat for rural schools).

**Infrastructure facilities**

There are two types of infrastructure required to implement the policy such as; Core ICT infrastructure \_computer, printer, scanner, projector, digital camera ,audio recorder and each school will be equipped with at least one Computer Laboratory with at least 10 network computers to begin with; at least one classroom will be equipped with appropriate audio visual facilities to support an ICT enabled teaching and learning ;computer will be provided at the library ,teachers common room and the school head office etc.

For any project to implement infrastructure is essential. Without proper infrastructure smooth functioning of IT education is not possible. IT @ school project indented to put in place a system for the proper supply of computer and accessories to schools. Laptops and multimedia projectors were supplied to all schools for shifting a mere IT lab based training to the class room. Thus the use of ICT as a supporting strategy for teaching learning process in our day to day classrooms because a common thing and the traditional formalities in the classroom learning process replaced by innovative technology.

**Other training programs are,**

Internet training-20 hour training programs was given to all SITC’s and school teachers .The trained SITC then trained all high school teachers in their school.

IT training for the visually challenged; The project has successfully imparted IT training using free software for teachers of special schools for visually challenged by exclusively using free software based screen reading software named ORCA.

Camera handling training; Two day training on camera handling was given to the teachers enabling them to create educational videos which could be beneficial in implementing ICT enabled education.

Training on ICT enabled content; Specific training on ICT enabled content was provided to teachers so as to enable them to use ICT enabled content in all subjects in order to equal teachers in classroom transaction.

Today as a result of the various initiative of IT @ school project, every student studying in the government schools in state enjoys the most of the educational facilities irrespective of his/her background. The teachers in Govt. schools are well trained to use these equipment’s to its maximum effectiveness. The project works entirely on (free and open source software) FOSS and it is considered to be the single largest simultaneous deployment of FOSS based ICT education in the world.

**Review of Related Studies**

The inclusion of IT in the curriculum as a subject and as a tool has provided wider access to the researches regarding its various aspects. Out of the vast studies related to IT, the investigator attempts to collect a few of them and is presented below.

Ravichandran and Sasikal (2001) described in a article “Computer based advanced technologies in education: developments, challenges and opportunities about the need and the change occurring due to the development in computer based technology in our education system. The introduction of interactive video, online discussion has improved student creative thinking, analytical skills, collaborative approach and integrative approaches. One of the main challenges faced today are the supply of quality course wares. In future, education will be dramatically enhanced by multimedia, computer simulation etc. a global educational system will emerge which will give opportunity to students and faculties to join together.

McFarlane (2001) described in an article about “Perspective on the Relationship between ILT and Assessment.” And considers the use of information and communication technologies (ILT) in schools as a set of skills or competencies. As a vehicle for teaching and learning and concludes that the value attributed to learning out comes determine the role of ILT in schools.

Sharma (2001) presented an article on ‘Teachers and information technology’. This describes the various use of IT by teachers and the issues related to use if IT. IT explains different strategies in IT to improve quality in teaching they are electronic text, audio and video conferencing interactive television, peer learning and self-learning for effecting teaching teachers should develop the ability and skills and should after their teaching strategies. This article ensure that both teachers’ students require professional knowledge in use of IT.

Steve (2001) published an article on ‘Information and Communication technologies and the changing role of the teacher. When examines the changing role of the teacher in the use of educational information and communication technologies (Explores several key issues, including effects and ICT on teaching and learning, the changing role of the teacher constructivist learning environment and new skills teachers may be expected acquire in order to make fruitful use of the new technologies.

Gopish (2002) compared the extent utilization of computer and internet facilities by PG students of CUSAT and Calicut University. Percentage analysis and test of significance of percentage done on the levels of utility of computer and internet showed that PG students in CUSAT and CU are highly exposed to computer and internet facilities and they have much more better facilities for the same.

Malik (2002) published an article on ‘Computers and schools shifting perceptions, changing models.’ This paper described changes in the role of computers and teachers in the teaching learning process. Author describes that school computing gained momentum with the project computer literacy and studies in schools (CLASS) and the National curriculum framework for school education -2000 (NCFSE-2000) which discuss about the integration of ICT in schools. With regard to this NCERT (2001) brought out the curriculum guide and syllabus for information technology in schools within the general framework of education.

Azeez (2002) Conducted a study on ‘Teacher’s awareness on educational informatics’ selected higher secondary school teachers as sample, findings reveal that 61% of the whole sample are aware abut revolutionary effect of information in the management of impact of ICT in education.

Hanmods (2003) conducted a study on impact of internet based teaching on student’s achievement. The study revealed that use of extensive interest based teaching materials has not adversely affected student’s learning/performance, but many benefited from it.

Baheerathan and Kumaravel (2004) conducted a study on the topic internet awareness among the teachers of mathematics at high school level. With the objective, to study the level of internet awareness among the teachers of mathematics is there is any significant difference between male and female teachers, under graduate and post graduate teachers, urban and rural teachers. The investigator selected 117 teachers using simple random technique from Thanjavor district and used interest awareness questionnaire which contained 25 objective type questions developed by the investigator, adopted t-test for statistical analysis. The findings reveal that awareness was not sufficient due to poor access to connected computers and lack of training. Study showed no significant difference between male and female teachers, under graduate and post graduate teachers, urban and rural teachers. They recommended that ICT should be made compulsory component of all teachers training course.

Kukreti and Saxsena (2004) published an article on ‘Information technology in teacher training programme: need and significance’. Investigator explains that single largest facto affecting the use of IT is the unavailability of trained persons and reluctance and resistance among the teachers using it. Some of the suggestions given to promote ICT in education are: integrate ICT in all teachers training programmes, organize in-service orientation programme and refresher courses, organize special in-service programme in summer vacation, and organize collaborative programmes between teacher training institution and technical institutions.

Bhutak (2004) conducted a study on “Development and Effectiveness of Multimedia Package for science subject of standard 9th.” The research was designed on two group’s randomized subjects only posttest designs. He compared the experimental group with control group. The finding reveals that multimedia package was more effective in terms of achievement and retention of science for both the group’s girls and the boys separately and jointly. The self-study material was more effect than slide show for girls, while slide show proved more effective than self-study material for boys (3). Slide show and self-study material were almost equally effective for girls and boys jointly.

Dadhania (2004) conducted the study on “Development and Effectiveness of computer Aided institution (CAT) programme for teaching the unit ‘pressure’ (Gujarati) in science of standard VIII. The research will conduct to develop a computer aided instruction (CAI) VIII. The findings are (1). There was no significant difference between the scores of subjects of two groups. So both CAI programme and traditional method of teaching were equally effective with reference to the achievement of the students. (2) The students expressed favorable opinion towards CAI programmes.

Chhag (2004) Conducted the study “Development and Effectiveness of computer aided instruction (CAI) programme for teaching the unit “Flower and Fruit” (Gujarati) in science of standard VIII”. It was in 7th Std students. The findings are (1) The computer Aided Instruction (CAI) programme was more effective than traditional method of teaching (2). Students showed favorable attitude towards CAI project.

Biswal and Chauhan (2005) conducted ‘A study on academic achievement of computer education with respect to students age, academic stream and educational qualification.’ Sample included 60 students studying computer software course in computer education institution in Vadodara city. Tools employed include periodical achievement test which contains the contents taught during a specific period of time and teachers rating scale prepared on 14 different dimension of computer education and analysed using ANOVA. Major findings include-no correlation between age and theory achievement in computer education, no significant relationship between educational qualification and computer education. It also revealed that academic stream and educational qualification and age are not significantly associated with the computer education performance. It suggested that opportunities should be given to students of all streams.

Joy and Shaju (2005) published a study ‘Developed a computer assisted teaching material in history at secondary level and its effectiveness’, with an objective to test the effectiveness of CAI and lecture method, also to verify the impact of gender, type of school on the effectiveness of teaching method. A sample of 162 students of 11th standard from 3 higher secondary schools of Trivandrum district were randomly selected. Tools for the study included the development of CAI on the topic UNO in history lesson, and an achievement test in history. A comparison of post test scores show computer assisted teaching group came superior over lecture method taught group without any gender difference, performance of urban students was better than rural students, also students of private school performed below than that of government school, the investigator mentioned that it may be due to sample selected consisted of more private schools in rural area significantly associated with the computer education performance. It suggested that opportunities should be given to students of all streams.

Volman (2005) conducted a study on ‘New Technologies, New Differences. Gender and Ethnic Difference in Pupils’ use of ICT in Primary and Secondary Education’. This paper investigates the accessibility and attractiveness of different types of ICT applications in education for girls and boys and for pupils from families with an ethnic minority background and from the majority population in the Netherlands. A study was conducted in seven schools (primary and secondary). Data were collected on participation, ICT skills and learning results, ICT attitudes and the learning approach of pupils. A total of 213 pupils completed a questionnaire and interviews were held with 48 pupils and 12 teachers. Gender difference, especially in primary education, appeared to be small. In secondary education, the computer attitude of girls seems to be less positive than that of boys, girls and boys take on different tasks when working together on the computer and they tackle ICT tasks differently. Pupils from an ethnic minority background in both primary and secondary education appear to consider themselves to be less skilled ICT users than pupils from the majority population. We found ethnic difference in participation in ICT activities at school in both educational sectors. Pupils from an ethnic minority background use the l area. Computer at school less for gathering information and preparing talks and papers and more for drill and practice. Differences between pupils from an ethnic-minority background and from the majority population is access to certain forms of ICT use out of school are confirmed at school instead of being compensated for. The paper includes with some recommendations on a diversity-oriented ICT policy at school level.

Nagappa and Shahapur (2005) examined the “Study of attitude of secondary school students towards computer assisted learning. Boys of aided schools have a more favorable attitude towards CAI than boys of government schools. The major findings of the study were (1) Girls of aided school in attitude towards CAI from girls of government schools (11). There are significant differences between boys and girls students’ of aided schools (1) respect of their attitude towards CAI (111). The significant difference is found between the boys and girls of government schools in respect of their attitude.

Vyas (2005) conducted the study “Development and Effectiveness of Computer Aided Instruction (CAI) programme for teaching the unit Microorganism in science and technology of standard VIII. The findings are (1) There was no significant difference between the scores of such two groups, so both CAI programmes are traditional and method of teaching were equally effectively with reference to the achievement of the students (2). The students expressed favorable opinion towards CAI programme.

Shah (2005): Did a study on ‘ICT awareness use and need of secondary and higher secondary teachers of English medium schools of Vadodara city- 12 secondary and 10 higher secondary schools selected using stratified random sampling technical further 60 secondary and 50 higher secondary out of 110 responded. It was found that a low and higher secondary teachers. The variable related 10 ICT awareness of teachers were teaching experience, age and total salary. The variables related to ICT awareness of teachers were teaching experience, age and total salary and computer training. The variables related with the ICT need of teachers well the degree programme which they attended at the university level.

Jonathan (2005) carried out a study on to examine the interplay of institutional forces behind higher ICT education of India. This study was observed three main empirical finding that is 1. Technology related higher education in India is clearly focused on the global economy and it is worthwhile to note the American standards and forms of knowledge (2). An exception of this support for language institution. They need to efficiently and carefully consider budget for essential expenditure on hardware and software.

Meenu (2006) conducted a study on ‘Utilization and effectiveness of television programs at primary school level’. The objectives were to study effect of ETC program on primary school children (class 3-5 in EVS and Mathematics), to study the attitude of class teachers towards quality of ETV program and also to make further recommendations quasi experimental design were used for sample of 40 students selected by purposive sampling technique. Tools include questionnaire for principal and teachers, an achievement test for class 3 and class 5 in EVS and Mathematics, a rating scale to measure teacher attitude towards ETV program. ANOVA was adopted as statistical technique. Findings reveal that students have significantly improved their learning achievement in both EVS and Mathematics. It also showed more favorable teacher attitude and leaner action towards ETV program, also their improvement in EVS helps to develop positive social values and cooperation among students.

Sherin (2006) analysed the ‘Use of computers among secondary school students’, with the help of 600 secondary school students of CBSE school. Tool used was a questionnaire on computer use. Percentage analysis and test of significance were the statistical technique used. Findings reveal that computer facility is available to a very high majority of students in schools, but all are not able to in access; 80% of students use for playing games, listening music and watching movies, 90% of students opined computer helps to understand topic better.

Venkateshwaralu (2006) published an article on ‘Changing role of teachers’ explains that teacher of the future are expected to perform the male of planned organizer of curricula, innovator of educational idea, practices and systems, writer of educational talks and computer programs, resources personal in the propagation of ever expanding knowledge. At the same time he will have to be a good communicator, efficient organizer of learning situations and democratic group leader.

Joshi (2007) conducted a study on ‘Educational technological awareness among perspectives in teachers’, sample consisted of 52 randomly selected prospective teachers doing. M.Ed in two different universities in Gujarat. Educational technology awareness scale were adopted which contains 3 components-material, method and devices and 5 points scale were given varying from 0-4 percentage analysis were used obtained percentage are 68.18, 68.18, 59.09 for instructional material, devices and method respectively which shows teachers were moderately aware abut educational technology.

Page and Thorsteinsson (2007) published a research paper on the topic ‘Technology enhanced learning in design and technology education’. This research investigates the role of new media and ICT for design and technology education. It provided a unique insight and recommendations for how new approaches for analyzing and understanding new media and ICTs enrich the everyday pedagogic practices in design and technology education. It identifies 5 learning scenarios which employ recent advances in technology and media to enhance learning they are student controlled learning lecture delivered learning use of wiki technology, dynamic information and digi design technology.

Tondeur (2007) conducted a study on ‘Curricula and the Use of ICT in Education: Two Worlds Apart?’. A survey was conducted among 570 respondents in a stratified sample of 53 primary schools. Results show that teachers mainly focus on the development of technical ICT skills, whereas the ICT curriculum centers on the integrated use of ICT within the learning and teaching process. This indicates the existence of a gap between the proposed and the implemented curriculum of ICT. Paper concludes with the potential value of school-based ICT curriculum that “translates” the national ICT-related curriculum into an ICT plan part of the overall school policy.

Nachimuthu and Vijayakumari (2007) did research on “Modern ICT trends in teaching technology”. They pointed out most of the teacher educators are not able to use the media technologies due to lack of training. He suggested that the teachers have to be equipped with the skills and abilities from time to time to was found between teacher’s constructivist beliefs and their level of ICT integration. This is partly be explained by the Chinees education tradition, based on the Confucian philosophy emphasizes “Group –based, teachers – dominated, and centrally organized pedagogical culture”.

Joy (2007) conducted a study on “Usage Internet: Practices and attitudes of teacher training results revealed that the study points to the need having more refreshers or training programmes teachers to get familiar with computer. It was found that those who had more access to computer having more favorable attitude towards using the computer also points to the same. Computer assisted instruction and evaluation using computer related technology is widespread, and has been introduced in the evaluation of students at the tenth standard level and teachers without favorable attitude towards CAI may pose a problem in the effective implementation of the programme at the school level.

Neelam and Kumar (2007) focused on “Attitude of Post graduate students towards internet. The results found that (i) Post graduate students have more favorable attitude towards the internet (ii). There is no significant difference between the attitude of male and female post-graduation students towards the internet (iii). There is no significant difference between the attitude of rural and urban postgraduate students towards the internet (iv). There is no significant difference between the attitude of Arts and Science post graduate students towards the internet (v). There is no significant difference between the attitude of science and commerce post graduate students the internet (vi). There is no significant difference between the attitude of arts and commerce post graduate students towards the internet.

Nimavathi and Ganadevan (2008) did research examine on effectiveness of multimedia programme on teaching science.” Results were found that multimedia programme prepared by the researcher is more effective for the achievement in science in ninth standard students. The student learning through multimedia programme are found to be better than the students learning through the conventional method of teaching.

Josh (2008) published an article on ‘Integrating ICT in M.Ed. program: and experience’. The author describes his experience of integrating technology in the M.Ed. program at Bhavnagar University, based on a ‘teach to future’ program sponsored by Software Company. A total of 46 students have enrolled in this program. It contained 12 modules, which included course content, evaluation scheme and scheduling. The overall effect was that the company has cultivated positive approach towards use of computers in their teaching also opined that all have gained a lot I the area of computer education, and they became reflective practiceners which helped them to improve.

Lytras (2008) discussed on the topic ‘Technology Enhanced Learning: Best Practices’. With the shift towards the knowledge society, the change of working conditions, and the high-speed evolution of information and communication technologies, peoples’ knowledge and skills need continuous updating. Learning based on collaborative working, creativity, multidisciplinary, adaptiveness, intercultural communication, and problem solving has taken on an important role in everyday life. “Technology Enhanced Learning: Best Practices” goes beyond traditional discussion on technology enhanced learning to provide research and insights on increasing the efficiency of learning for individuals and groups, facilitating the transfer and sharing of knowledge in organizations, and understanding of the learning process by exploring links among human learning, cognition, and technologies. This officers estimable, comprehensive research to researchers and practitioners in the field of technology enhanced learning in various disciplines, including education, sociology, information technology, work place learning, entertainment, healthcare, tourism, and many others.

Uniyal and Pandey (2008) conducted a study on ‘Teacher’s attitude towards computer in education in relation to sex, age, locality and experience.’ The researcher visited Uttar hand schools. A questionnaire consisted of 5 statements each statement answered yes or no forms were used. Tools were administered on a sample of 70 teachers and used percentage analysis. The study revealed that teachers of urban areas were found to be a better user of computer in their teaching than teachers from rural areas also there is no major difference between male and female teachers in the opinion of computer education. Teachers who are above 40 years and having length of service more than 20 years have more favorable opinion about computer knowledge in class room teaching.

Kamalanayan (2008) designed a study on implication of information technology for teacher education and research. It was pointed out that information technology in education is credited the need for all teacher education facilities to be proficient in the use and integration of ICT into main stream teacher education programme delivery.

Philip (2008) examined on ICT attitudinal characteristics and use level of Nigerian teachers. Results revealed that ICT use level of teachers was significantly related with each and the combination of attitude constructs. The finding also revealed that perceived control factor, behavioral factors and defense factors contribution. Mostly to the prediction of ICT use levels of teachers. A major finding of the study is that ICT use level and each of the attitudinal constructs are significantly related. Particularly, the study determined that behavioral factor and perceived control factor have the strongest relationship. The usefulness of technology is now universally acknowledged, thus perceived usefulness does not dissimilate among today, technology users. The reason why perceived case of use does not predict use level among teachers is not immediately apparent.

Abdullah (2009) conducted a study on “Barriers of the successful integration ICT in teaching and learning environment. The study found that teachers have strong desire for the integration of the into education but that they enough many barriers to it. The major barriers were lack of competence and luck of access to resources. Since confidence competence and accessibility have been found to be critical components for technology integration in ICT resources including software and hardware effective professional development, sufficient time and technical support need to be provided for teachers.

Meskerem and Linda (2012) conducted a study on conditions for Successful Use of Technology in Social Studies Classrooms. The purpose of the authors in this review is to examine how teacher-related, context-related, and project-related conditions interact in successful cases of technology integration projects in social studies classrooms. A close examination of different dimensions of these conditions in the implementation of 33 successful cases of technology-assisted projects showed the importance of strong pedagogy-technology alignment. This is in line with the emphasis given to the centrality of technological pedagogical content knowledge by the practitioner in the technological pedagogical content knowledge framework. Other conditions found to be important for the success of the projects were focus and clarity of targeted learning outcomes and the supportive role of teacher educators when collaborating with teachers in designing and implementing the projects. The implication of these findings for school research and practice and teacher education is discussed.

Lee; Tsai; Chai and Koh (2014) conducted a study on Students' Perceptions of Self-Directed Learning and Collaborative Learning with and without Technology. This study explored students' perceptions of self-directed learning (SDL) and collaborative learning (CL) with/without technology in an information and communications technology-supported classroom environment. The factors include SDL, CL, SDL supported by technology, and CL supported by technology. Based on the literature review, this study hypothesized that students' perceptions of learning without technology positively predict their perceptions of learning supported by technology. An instrument was developed and two studies, a pilot study and a main study, were undertaken. The pilot study surveyed 219 secondary school students and established the factors through exploratory factor analysis with good validity and reliability. The main study surveyed 500 secondary school students to confirm the factors and to establish the relationships between these factors through structural equation modeling. The results validated the four-factor structure model and revealed that students who reportedly engaged in SDL and CL in face-to-face contexts also engaged in these forms of learning in technology-supported contexts. The findings indicate that students' learning without technology support is related to their use of technology for learning. It may be advisable for teachers to develop students' learning processes in the face-to-face context without technology before engaging them in technology-supported learning.

Hamonangan (2014) conducted a study on factors affecting teacher’s competence in the field of Information Technology. The development of learning technology today, have a direct impact on improving teachers' information technology competence. This paper is presented the results of research related to teachers' information technology competence. The study was conducted with a survey of some 245 vocational high school teachers. There are two types of instrument used in taking the data, namely questionnaires and observation sheets. Questionnaire was used to obtain data on teacher interpersonal communication, use of information technology tools, teachers' perceptions toward information technology, and self-improvement of teachers. Observation sheet used to obtain data on teacher competence in the field of information technology Data was analysed using path analysis through SPSS 12 and LISREL 8:30. The analysis showed teachers' competence in the field of information technology is influenced by the teacher interpersonal communication, use of information technology tools, teachers' perceptions toward information technology and self-improvement of teachers either directly or indirectly.

,Ahmet; Serhat and Zeynep (2015) conducted a study on Utilization of Information and Communication Technologies as a Predictor of Educational Stress on Secondary School Students. The purpose of this study is to examine the relationship between utilization of information and communication technologies and educational stress. Participants were 411 secondary school students. Educational Stress Scale and Utilization of Information and Communication Technologies Scale were used as measures. The relationships between students' educational stress and utilization of information-communication technologies were examined by using correlation analysis and stepwise regression analysis. Educational stress was predicted positively getting information, research, communication, game and self-expression. Results were discussed with respect to the related literature.

**CHAPTER III**

**METHODOLOGY**

* **Objectives of the study**
* **Methods used for the study**
* **Tools used for data collection**
* **Sample for the study**
* **Data collection procedure**
* **Scoring and consolidation of data**

**METHODOLOGY**

Research is an intellectual and creative endeavor to discover, develop and verify knowledge. It entails objective and systematic effort to offer solutions to the problem and to formulate policies and programmes. It is a scientific enquiry which is designed to collect, analyse and use data to understand, describe, predict and control educational or psychological phenomenon or to empower individuals in such context.

Methodology of research is the description and rational of the diverse phase of conducting a research .It details the varied sequential stages that are generally adopted by a researcher to enquire into the research problem along with the logic behind them. Thus the researcher should formulate the methodology best suited to the nature of the problem under study.

The present study is mainly intended to examine **“**Problems and prospects of IT instruction and examination at secondary level under the IT @ school project of Kerala”. The methodology of the study is described under the following heads.

* Objectives of the study
* Methods used for the study.
* Tools employed for the study.
* Sample selected for the study.
* Data collection procedure.
* Scoring and consolidation of data.
* Statistical technique used for collection of data

**Objectives of the Study**

The major objectives of the study are as follows:

* + - * To identify the problems and challenges faced by the teachers and students in the IT instruction and examination at secondary school level.
* To analyse the process and procedures of IT instruction and Examination at secondary level conducted by IT @ school project of Kerala.
* To identify the major strength and limitations of IT instruction and examination at secondary level.
* To suggest better strategies for improving the overall quality of IT instruction and examination at secondary schools of Kerala.

**Methods used for the study**

Survey method is used for developing generalizations about populations. This method selects a sample that is representative of a larger population and uses the results to generalize about that population as a whole. Surveys are useful mainly for describing patterns in large groups rather than in depth analysis of individual’s views. According to Best and Khan (2002), “The term descriptive research has often been used in collectedly to describe three types of investigation that are defined. Perhaps their superficial similarities have obscured their difference. Each of them employs the process of disciplined inquiry through the gathering and analysis of empirical data, and each attempts to develop knowledge. To be done competently, each requires the expertise of the careful and systematic investigator. A brief explanation may serve to put each one in proper perspective.” The method of research which concerns itself with the present phenomena in terms of conditions, practices, beliefs, processes, relationships or trends invariably is termed as “descriptive survey study.”

The survey research employs applications of scientific method by critically examine and examining the source materials, by analyzing and interpreting data, and arriving at generalization and prediction. Since, the present study explores Problems and prospects of IT instruction and examination at secondary schools, the investigator decided to adopt descriptive survey as the design of the study.

**Tools used for collecting the study**

Tools of research are required to collect evidences to empirically validate the research hypothesis or find out answer to the research questions. The nature of any kind of tool or technique for a research work depends on the objectives of the study and the investigator also has to look into the various characteristics of the research tool like validity, reliability, comprehensiveness and usability.

Considering the above objective of the study, the investigator has developed the following two research tool for collecting data from selected sample.

* Questionnaire on IT instruction and soft examination for secondary school teachers. (Sukanya and Saleem 2015)
* Questionnaire on IT instruction and soft examination for secondary school students ( Sukanya and Saleem 2015)

On the basis of collected information from all sources investigator planned the questionnaire. Interaction with students, friends and others also helped the investigator in the questionnaire preparation. Discussion with experts, supervising teacher also served as a help line for preparing questionnaire. The investigator reviewed vast amount of literature regarding internet. The different sources used for item development are textbooks, journals and the special literature, published by IT @ School project in different times.

A brief description of the procedure followed in the development of the tools is presented below

**Questionnaire on IT instruction and soft examination for secondary school teachers and students.**

Both the tools were prepared on the basis of three dimension that is, process and procedure, strength and limitation and challenges with regard to IT instruction and examination. These tools composed of two parts, part I and part II. Part I was meant to collect general data such as name, gender, type of management etc. Part II of questionnaire for teachers consists 41 items and questionnaire for students consists 28 items based on the predetermined dimensions.

**Preparation of items.**

In order to collect the relevant required data for the study the investigator developed questionnaires on IT instruction and software examination. The investigator tried to collect all the relevant related materials in IT instruction and software examination,while selecting items to the tool.

Each item of the questionnaire was selected and prepared by the investigator with the help of the supervising. Based on the objectives in mind, appropriate 46 items were initially prepared for the draft test, for teachers and 32 items for the students. The items were examined thoroughly and subjected to criticism and evaluation. Based on this draft, questionnaire was restructured incorporating relevant items and deleting some of the items which were found not suitable. After proper modification, final form of questionnaire was prepared for administering among the selected sample which comprises 41 questions altogether, for teachers and 28 questions for students. The selected responses were scored with the help of scoring key. The scoring was done by awarding 2 marks to the response “yes” and 1 mark to the response “no”. A brief description on the dimension s of tool as follows:

**Process and Procedure of IT instruction and examination**

In the context of the introduction of IT instruction and soft examination at secondary level, there were number of problem faced by the concerned authorities teachers and students with regard to its operations and mode of actions. The introduction and implementation level of IT instruction, necessitate a series of operation and programme of actions. After the implementation of this mission, a series of problems, have been facing the concerned authorities, teachers and students at its process and procedure level. In order to identify such problems the investigator incorporated relevant items and questions in this part of questionnaire.

For Eg:

* Do you have the opinion that separate teachers are required for IT subjects
* Do you have the opinion that additional information outside the prescribed computer syllabus also needs to be included in soft exam.

**Strength and limitation of IT instruction and examination**

To identify strength and limitation of IT instruction and examination is also a major objective of the study. When compared to the exams of other subjects IT examination has its own peculiarities and at the same time some sort of limitations also. Hence, the investigator has included relevant item and questions in the questionnaire.

For Eg:

* Is the present school facility sufficient for providing?
* Do you feel that trust of soft exam is ruined as the students initially attending the exam shares questions with others?

**Challenges of IT instruction and examination**

After launching of IT instruction and IT soft examination a number of academic and administrative challenges have been facing by the concerned authorities teachers and students. Identifying such challenges definitely helps to overcome such problem in future and to implement the IT instruction and examination successfully at secondary school level. Hence investigator selected the challenges as a component to be included in the questionnaire accordingly relevant and appropriate items have included in the questionnaire.

For Eg:

* Are you able to solve the technical problems that may arise in the lab?
* Do you have the opinion that the conduction of IT exam in institution with more students is difficult?

**Validity of the tool**

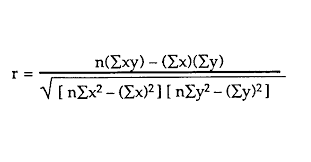
According to Best and Khan (2002) validity is that quality of a data gathering instrument or procedure that enables it to measure what it is supposed to measure. The validity of the present questionnaire is done through face validity. The items in the present questionnaire prepared in ambiguous way and the meaning of the items are clearly defined. Face validly was ensured by means of discussion and consultation with experts and authorities in the field. To ensure face validity, the investigator discussed various aspect of the issues with the experienced teachers’ experts and other concerned authorities.

**Reliability**

Reliability of the test indicate the degree of consistency and accuracy with which it measures what it has been intended to measure. If the result of the test is reliable, the result of whole study should also show consistency.

The reliability of the present questionnaire was estimated by test retest method. The scale was administer to a group of sixty higher secondary school students and again repeated in the same group of peoples with an interval of three weeks. The correlation between first test score and second test score were calculated using Pearson’s product moment coefficient of correlation.

Where



Here

r = coefficient of correlation

n = Number of paired scores

= sum of obtained scores of variable x.

= sum of obtained scores of variable y.

= sum of squares of the obtained score variable x.

= sum of squares of the obtained score variable y.

= sum of the product the obtained scores of variable x & y.

The reliability of the test on the secondary school IT instruction and examination for teachers was found to be 0.78 and for the student it is 0.71. There are no wide variation in the responses of teachers and students between first test and second test. It suggests that there is high degree of consistency in the responses which means the questionnaires prepared for teachers and students are reliable.

**Sample selected for the study**

A sample is a part of the population which is studied in order to make inferences about the whole population. Good sample of a population is one which will produce all the characteristics of the population with great accuracy.

For the present study, the investigator adopted stratified random sampling technique for the selection of the sample. The stratified random sampling technique is designed to ensure total representation and avoid bias. The data was applicable, since the population was composed of strata of difficult sizes. So that, a representative sample contained individual drawn from each category or stratum in accordance with the size of the sample. Based on the nature of the study and type of statistical technique intended to be used, the size of the sample was fixed.

**Factors to be considered for selecting the sample**

Gender:

Generally, the difference of responses occurs among males and females. So, the investigator gives equal representations for male and females.

Type of management of the instruction:

The schools are run by the government directly through the state department of education and by the aided management schools were selected almost equally.

The details regarding the breakup of the whole sampling based on gender and type of management and the details of schools and the number of teachers and students selected from each school are presented below in   
table 1.

Table 1

*Breakup of the final sample*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample | Gender | | | Type of management | | |
| Male | Female | Total | Govt | Aided | Total |
| Teachers | 65 | 139 | 204 | 99 | 105 | 204 |
| Students | 266 | 268 | 534 | 292 | 242 | 534 |

**Data Collection Procedure**

As a first step, the investigator collected list of schools in Kozhikode district and Malappuram districts by giving due representation of sub samples, investigator contacted head of the institutions for permission for collecting the data. The investigator met teachers individually and explained the nature and confidentiality of the study and made them convinced. After providing proper instruction to students also, copies of the questionnaire were given and collected back from each school.

**Scoring and Consolidation**

Scoring and consolidation of answer sheet was done according to the direction provided with each questionnaire. Collected data more consolidated for making interpretation on the basis of percentage analysis of the response, for convenience one score is given for the response NO and two for response YES. After calculating the total numbers of each response, the percentage was find out and interpreted accordingly.

**Statistical Technique used for Collection of Data**

Analysis of the collected data and its interpretation can be done only with the help of statistical technique, the major statistical techniques used for the present study is percentage analysis.

**CHAPTER IV**

**ANALYSIS AND INTERPRETATION   
OF DATA**

* **Objectives of the study**
* **Analysis of data**
* **Discussion of the result**

**ANALYSIS AND INTERPRETATION**

The research data become meaningful in the process of being analysed and interpreted. It involves the tabulated material in order to determine inherent facts or meanings .Analysis of the data is the heart of Research report. However valid ,reliable, adequate the data may be, it does not serve any worthwhile purpose unless it is carefully edited ,systematically classified and tabulated, scientifically analysed, intelligently interpreted and rationally concluded.

The data are studied from as many angles as possible to explore the new facts (Koul, 1984).The analysis of the data represent the application of deductive and inductive logic to the research process. It involves a number of closely related operations that are performed with the purpose of summarizing the collected data and organizing these in such a manner that they will yield answers to the research question. Organization of data includes editing classification and tabulation. Editing implies checking of the gathered raw data for accuracy, usefulness and completeness. Classification refers to categorization of the data into different classes, groups and heads. Tabulation is the process of transferring data gathering instruments to the tabular form. Analysis consists of a number of strategies which involves the filtering linking and distilling of a diverse body of information. Analysis involves braking down of the complex data into simplex segments and putting them together in new configuration to bring out inherent meanings and interpretations.

The present study attempts to analyse the problems and prospects of IT instruction and examination at secondary schools. In order to realize the objectives framed the investigator collected relevant data from Teachers, students school authorities and experts in the field.

This chapter presents of the analysis of data collected for the study, followed by interpretations and discussions. The consolidated data were analysed on the basis of predetermined objectives. The major objectives of the study listed below:

* To identify the problems and challenges faced by the teachers and students in the IT instruction and examination at secondary school level.
* To analyse the process and procedures of IT instruction and Examination at secondary level conducted by IT @ school project of Kerala.
* To identify the major strength and limitations of IT instruction and examination at secondary level.
* To suggest better strategies for improving the overall quality of IT instruction and examination at secondary schools of Kerala.

On the basis of the objectives of the study investigator developed two tools for teachers and students of secondary schools and collected their responses, regarding IT instruction and examination. The discussions of results were presented under following heads.

* Responses of secondary school teachers on IT instruction.
* Responses of secondary school teachers on IT examination.
* Responses of secondary school students on IT instruction.
* Responses of secondary school students on IT examination.

Data were analysed and interpreted under each heads on the basis of pre-determined dimensions of tool construction that is process and procedure, strength and limitation, challenges in secondary school IT instruction and examination.

**Responses of secondary school teachers on IT instruction.**

**Process and procedure of IT Instruction**

This part of the analysis is based on the responses of secondary school IT teachers about the Process and procedure of IT instruction .The number and percentage of responses of secondary school IT teachers about the process and procedure of IT instruction is presented as table 2:

Table 2:

*Responses of teachers regarding process and procedure of IT instruction*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Q No | Item | Responses | | | |
| Yes | % | No | % |
| 1 | Do you have the opinion that instead of studying IT as a separate subject at HS level, its better to integrate with other subjects. | 122 | 59.80 | 82 | 40.19 |
| 2 | Are the students perfectly executing the CCE activities in IT | 118 | 57.84 | 86 | 42.15 |
| 3 | Do you agree with the statement that IT studies in 8th and 9th classes are not considered as important as that in tenth standard | 124 | 60.78 | 80 | 39.21 |
| 4 | During the IT practical sessions, is it possible to pay attention to each student individually | 79 | 38.72 | 125 | 61.27 |
| 5 | When compared to other subjects does the IT practical become more useful to the students | 179 | 87.74 | 25 | 12.25 |
| 6 | Do you feel the difficulty in managing IT and your subject concurrently | 50 | 24.50 | 154 | 75.49 |
| 7 | Do you have the opinion that separate teachers are required for IT subjects | 135 | 66.17 | 69 | 33.82 |
| 8 | Do you make special preparations for taking IT classes | 184 | 90.19 | 20 | 9.80 |
| 9 | Do you have the opinion that the presentation of It lessons are harmonious to their evaluation methods | 147 | 72.06 | 57 | 27.94 |

The table 2 reveals that out of 204 teachers, 59.80% responded that, they have the opinion of integrating IT with other subjects in the instructional process, but 40.19% teachers are not in favor to this. 57.84% of teachers support with the proper execution of CCE activities in IT and 42.15% of teachers are not support to the execution of CCE activities. Out of 204 teachers, 60.78% of teachers responded that IT studies in 8th and 9th classes are not considered as important as that in 10th standard. However, 39.21% disagree with this statement that IT studies in 8th and 9th standard class are not considered as important as that in 10th standard. Out of 204 teachers selected 38.72% of teachers responded positively that during the IT practical sessions it is possible to pay attention to each student individually, at the same time 61.27% disagree with this. Out of 204 teachers 179 teachers (87.74%) responded positively that IT practical become more useful to the students, when compared to other subjects. Only 25 teachers (12.25%) disagree with this. 24.50% of teachers agreed positively, that teachers are not feeling difficulty in managing IT along with their subject teaching. But 75.49 % of teachers responded that they feel difficulty in managing IT along with their subject concurrently. With regard to the statement whether the teachers are having the opinion that separate teachers are required for IT subject. 66.17 % of teachers responded positively that separate teachers are required for teaching IT subjects. But 38.2 % teachers are not agreeing with this and they have the opinion that separate teachers are not required for teaching IT subjects. Out of 204 teachers selected for the sample 184 teachers that is 90.19 % teachers agreeing positively that special preparations are required for making IT classes. Only 20 teachers that are 9.80 % disagree with this and they have the opinion that special preparations are not required for taking IT classes. 78.06 % of teachers have the opinion that the presentations of lessons are in tune with their evaluation methods. 29.94 % of teachers are not agreeing with this and they have the opinion that the presentation lessons are not I Tune their evaluation method.

From the above discussions, it is clear that, almost all teachers agreed with the ability and usefulness of the IT practical’s and compare to other subjects. 72.06 % of teachers have opinion that the presentations of lessons are in tuned with their evaluation methods. Most of the teachers have an opinion that separate teachers are required for teaching IT subjects. It is to be noted that the ICT teachers remarks about the importance given to ICT studies at Xth standard than VIIIth & IXth and then have to be changed and equal importance to be given to all standards . From the responses, it has also noted that majority of the teachers feeling difficulty in managing IT studies along with other subjects. Majority of the teachers have an opinion that it is better to integrate ICT with other subjects.

**Strength and Limitations of IT Instruction**

This part of analysis is based on the responses of secondary school teachers about the strength and limitations of software based IT instruction. The number and percentage of responses of secondary school teachers regarding strength and limitations of IT instruction is presented as table 3.

Table 3

*Responses of the teachers regarding strength and limitations of IT instruction.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| QNo: | Item | Responses | | | |
| Yes | % | No | % |
| 10 | Are students giving necessary importance of IT subject compared to other subjects | 104 | 50.98 | 100 | 49.01 |
| 11 | Is the present school facility sufficient for providing | 32 | 15.68 | 172 | 84.31 |
| 12 | Do you have the opinion that the training received by you is sufficient in conducting IT practicals | 87 | 42.64 | 117 | 57.35 |
| 13 | Do you have the opinion that IT should be maintained as a mandatory subject | 107 | 52.45 | 97 | 47.54 |
| 14 | Do you make the use of possibilities of IT like presentation software for teaching and learning activities of other subjects | 167 | 81.86 | 37 | 18.14 |
| 15 | Are the student made aware of the possibilities and limitations of internet | 185 | 90.68 | 19 | 9.31 |

Table 3 reveals that out of 204 secondary school teachers, 50.98% have responded that students were giving necessary importance to IT subject compared to other subjects. But 49.01% teachers disagree with this. They have responded that students are not giving equal importance to IT subjects compared to other subjects. With regard to the provision of physical facilities and instructional facilities in the school for conducting practical classes only 15.68% of teachers responded positively. 84.31% of teachers responded that the school sure not having the adequate facilities for impacting IT practical classes. The question regarding to the training programme given to teachers were sufficient and helpful for conducting practical classes, only 42.64% of teachers responded positively. At the same time 57.35% of teachers are not satisfied with the training programme that they received and it is nonsufficient and helpful for conducting practical classes for students. 52.45% of teachers agreed positively and they have the opinion that IT should be taught as a compulsory subject. At the same time, 47.55% of teachers not having the opinion of teaching IT as a compulsory subject at the secondary level. 81.86% teachers were making use of the possibilities of IT like presentation software for teaching and learning actives of other subjects. 18.14% are not using the facilities for teaching other subjects. 90.68% of teachers have responded that students were aware the possibilities and limitations of internet. Only 9.31% of teachers have responded that students were not aware the possibilities and limitations of internet.

It is clearly evident from the result that majority of the students (90.68) are aware of the possibilities and limitations of the internet. 81.86 % responded that they are making use of IT facilities in the teaching learning process and students are also giving necessary importance to IT subjects. But it is clearly evident from the analysis of data that the most of the schools are not having adequate facilities for teaching IT. And the training received by the teachers is not sufficient for the conduct of practicals in IT.

**Challenges of IT instruction**

This part of analysis was done based on the data collected through teacher’s responses on about the challenges in IT instruction. The number and percentage of responses of teachers regarding challenges is presented as   
table 4

Table 4

*Responses of teachers about the challenges of IT instruction.*

| Q No: | Item | Responses | | | |
| --- | --- | --- | --- | --- | --- |
| Yes | % | No | % |
| 16 | Do you have the opinion that the relevant IT syllabus encourages the students for higher studies in the subject | 128 | 62.74 | 76 | 37.25 |
| 17 | Are you able to solve the technical problems that may arise in the lab | 107 | 52.45 | 97 | 47.55 |
| 18 | Is it possible to obtain sufficient numbers of computers depending on the number of students in practical classes | 17 | 8.33 | 187 | 91.67 |
| 19 | Do you have the opinion that the teachers handling IT needs to do other courses in addition to in service training | 167 | 81.86 | 37 | 18.14 |
| 20 | Do you have the anxiety that job opportunities of teachers are diminishing due to computerization | 26 | 12.75 | 178 | 87.25 |
| 21 | Do you present other subjects in classes by relating to IT | 165 | 80.88 | 39 | 19.12 |
| 22 | Do you find it possible to complete the lesions in correct time as per the prescribed syllabus | 127 | 62.25 | 77 | 37.75 |
| 23 | Are you able to make use of modern facilities like VICTERS a part of IT  learning | 94 | 46.00 | 110 | 53.92 |
| 24 | Do you have the opinion that IT books should be frequently updated as the subject undergoes day to day changes | 190 | 93.14 | 14 | 6.86 |
| 25 | Do you impart special training for students who are backward in IT | 108 | 52.94 | 96 | 47.06 |
| 26 | Do you have opinion that IT subject is more useful in teaching maths and science subjects | 200 | 98.04 | 4 | 1.96 |
| 27 | Do you have the opinion that the evaluation of other subjects should be changed to the model for IT | 113 | 55.39 | 91 | 44.61 |

Table 4 reveals that out of the total sample selected 62.74% of teachers have the opinion that the study of the secondary school IT syllabus will motivate them for joining for higher studies in the same subject. But, 37.25% of teachers were disagreed with these statement. 52.45% of teachers have responded positively that they can solve the technical problems that may rise in the IT laboratory. At the same time, 47.55% of teachers disagree with this and they were not in a position to solve the technical problems that may arise in the IT laboratory. The question regarding the availability of the number of computers required in classroom only 8.33% teachers agreed to this, at the same time 91.67% of teachers have of opinion that the IT classrooms are not having adequate number of computer required. 81.86 % of teachers responded that teachers handling IT needs to do other courses in addition to in-service training only 18.14% of teachers disagree with this. 12.75% teachers are having the anxiety that job opportunity of teachers are minimising due to computerisation. But 87.25% of teachers disagree with this and there is no anxiety for them about the job opportunities of teachers, in the context of computerisation. 80.88% teachers agree that they present other subject classes by using IT and utilise the facility of IT while teaching other subjects. Only 19.12% teachers disagree with this and they will not handle classes by using IT.

An analysis of the data interpreted above, it can be seen that 81.86% teachers needs more on the subject. 80.88% teachers are utilising the facility of IT while teaching other subject only 52.45% teachers can only able to solve the problems that may arise in the IT laboratory. 91.67% teachers responded that the number of computers available in the IT laboratory is very less.

62.25% of teachers expressed their view that they can complete their portions in the prescribed time limit 37.75% teachers disagree, with this that they cannot finish their lessons within the stipulated time. 46% of teachers are able to use modern facilities like VICTERS as a part of IT learning. 53.92% teachers are not in favour of this. With latest developments, 93.14% of teachers have responded positively and only 6.86% of teachers have disagree with this, the question on special training for backward students only 52.94% teachers agreed the need of imparting special training for backward students. 47.06% of teachers have responded negatively and disagreed to this. 98.04% teachers have opinion that IT subjects are more useful for teaching mathematics and science subjects. Only 1.96% of teachers disagree to this. 55.39% of teachers agree that the system of evaluation of other school subjects to be changed in tune with the evaluation system followed to IT subjects. 44.61% of teachers disagree with this.

An analysis of data reveals that 81.86% of teachers need more training in the subjects for developing better teaching competency. 80.88% teachers are utilizing the facilities of IT while teaching other subjects. Only 52.45% teachers were able to solve the technical problems that may arise in the laboratory. 91.67% teachers responded that the number of computers available in the IT lab were comparably very less. 98.04% of teachers agreed that IT subjects more useful in teaching mathematics and science. 93.14% of teachers have responded the need for updating IT books in tune with changes in the subjects concerned.

**Responses of secondary school teachers on IT examinations**

**Process and procedure for IT examinations**

To analyse the responses of teachers regarding the process and procedure of IT examination, data were consolidated and the number of responses and percentage is presented as table 5.

Table 5

*Responses of teachers regarding process and procedure of IT examination*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Q. No: | Item | Responses | | | |
| Yes | % | No | % |
| 28 | Being a practical oriented subject, do you agree with the statement that theory exam is not required for IT at HS level | 58 | 28.43 | 146 | 71.57 |
| 29 | Do you have the opinion that additional information outside the prescribed computer syllabus also needs to be included in soft exam | 118 | 57.84 | 86 | 42.16 |
| 30 | Do you agree with the conduction of theory exams using soft exam method | 146 | 71.57 | 58 | 28.43 |
| 31 | Do you feel difficulty in completing the lab installation jobs for the conduction of soft exam | 113 | 55.39 | 91 | 44.61 |
| 32 | Do you have the opinion that the allotment of 10 marks for the theory exam is adequate | 123 | 60.29 | 81 | 39.71 |
| 33 | Do you have the opinion that the current question patterns of theory exams should be changed | 96 | 45.59 | 108 | 52.94 |

Table 5 reveals that 28.43% teachers responded that the theory examination is not required for IT at high school level. But 71.57% teachers disagree with this. 57.84% of teachers responded that additional information outside the prescribed computer syllabus also to be included in the soft examination. 42.16% of teachers disagree to this. 71.57% teachers are in favour to the conduct of theory examination using software method. 28.43% of teachers disagree with this statement. 55.39% of teachers responded that they feel difficulty in completing lab installation job for the conduct of soft examination. 44.61% of teacher disagree with this statement. 60.29% teachers have the opinion that the allotment of 10 marks for the theory examination is adequate. But 39.71% of teachers disagree with this statement. 45.59% of teachers have the opinion that current question patterns of theory examination should be changed. At the same time 52.94% of teachers disagree with this.

An analysis of the above results shows that 71.57% of teachers disagree with the statement that the theory examination is not required for IT at H.S level. 71.57% teachers positively responded that the conduct of theory examination using soft examination method. 60.29% of teachers expressed their view that the allotment of 10 marks for the theory examination is adequate. 57.84% teachers expressed their view positively that additional information outside the prescribed computer syllabus also needs to be included in the soft examination and 55.39% of teachers feel difficulty in completing the lab installation jobs for the conduction of soft examination.

**Strength and limitations of IT examinations**

To analyse the responses of teachers regarding the strength and limitations of IT examination, collected data were consolidated and the number of responses and percentage is prescribed as table 6.

Table 6

*Responses of teachers regarding the strength and limitations of IT examination*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Q. No: | Item | Responses | | | |
| Yes | % | No | % |
| 34 | Do you have the opinion that IT exams of classes VII & IX are not given enough importance | 131 | 64.22 | 73 | 35.78 |
| 35 | Do you have the opinion that teachers generally show | 73 | 35.78 | 131 | 64.22 |
| 36 | Do you feel that trust of soft exam is ruined as the students initially attending the exam shares questions with others | 85 | 41.67 | 119 | 58.33 |
| 37 | Do you agree with the statement that being a software based exam can create doubts in the trustworthiness of result | 62 | 30.39 | 142 | 69.61 |

Table 6 reveals that 64.22% of teachers responded that the IT examination conducted viii and ix are not at all serious. But 35.78% of teachers are not accepting the statements. 35.78% of teachers agreed that teachers generally show any interest in soft examination; But 64.22% teachers have expressed their disagreement 41.67% of teachers have expressed the view that the faith in the soft examination has lost among students due to the freedom for sharing of answers between students. 58.33% of teachers have expressed their disagreement on this. 30.39% teachers agreed with the statement that being software based examination; there is a possibility of losing it truthfulness and trustworthiness among students. At the same time 69.61% of teachers disagree with this.

It can be noticed from the analysis, that there are strength and limitations for IT examination. 64.22% of teachers have opinion that the IT examination viii and ix are not conducting systematically and seriously. 64.22% teachers have opinion that teachers are not showing much interest in soft examination. 58.33% teachers expressed the view that the seriousness and truthfulness in the soft examination have lost among students due to the freedom that they are getting for sharing the answers. 69.61% of teachers have the opinion that credibility and trustworthiness of soft examination are lost among students are some of the major limitation of IT soft examination. **Challenges of IT examinations**

To analyse the responses of teachers regarding the challenges of IT examinations, collected data were consolidated and the number of responses and percentage is prescribes as table 7.

Table 7

*Responses of teachers regarding the challenges in IT examination*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Q.No. | Item | Responses | | | |
| Yes | % | No | % |
| 38 | Are soft exams becoming cause for inducing new doubts and more learning possibilities in students | 164 | 80.39 | 40 | 19.61 |
| 39 | Do you have the opinion that the conduction of IT exam in institution with more students is difficult | 130 | 63.73 | 74 | 36.27 |
| 40 | Are the ICT facilities in school adequate for the conduction of soft exam | 93 | 45.59 | 111 | 54.41 |
| 41 | Do you find it possible to resolve the technical difficulties that may incur between It soft exam | 105 | 51.47 | 98 | 48.04 |

Table 7 reveals that 80.39% of teachers have the opinion that the introduction of IT soft examination should develop new learning skills and possibilities. 19.61% of teachers reject this statement. 63.73% of teachers have the opinion that the conduct of IT soft examination with large number of students in an institution is difficult. 36.27% of teachers are not accepting this view point. 45.59% of teachers agreed that the ICT facilities provided in the school is inadequate for the conduct of IT soft examination. 54.11% of teachers were not agreeing with this. 51.47% of teachers accepted that they can solve the technical difficulties that may arise at the time of IT soft examination.

The interpretation of the result reveals that there are challenges and issues to be faced in the smooth conduct of IT soft examination. Inadequate ICT facilities in the institution was seen a major challenge. Classes with large number of pupils and other technical efficiencies were found to be another challenge to be faced in the conduct of IT soft examination.

**Responses of secondary school students on IT instruction.**

**Process and procedure of IT instruction.**

This part of the analysis is based on the responses of secondary school students about the process and procedure of IT instructions. The number and the percentage of responses of secondary school students about the process and procedure of IT instruction is presented as table 8.

Table 8

*Responses of students regarding process and procedure of IT instructions.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| QNo: | Item | Responses | | | |
| YES | % | NO | % |
| 01 | Do you have the opinion that IT must be taught by separate specialist teachers in High Schools | 482 | 90.26 | 52 | 9.74 |
| 02 | Do you have the opinion that the evaluation scale of other subjects must be changed to the way as that of the IT subject | 248 | 46.44 | 286 | 53.56 |
| 03 | Are you provided with separate classes on the possibilities and use of Internet in your school | 103 | 19.28 | 431 | 80.71 |
| 04 | Were the teachers were able to teach and complete the syllabus of IT within the stipulated time | 291 | 54.49 | 243 | 45.50 |
| 05 | Do you library have enough reference books on IT | 162 | 30.34 | 372 | 69.66 |
| 06 | Do you have the opinion that your teachers have introduce you properly with the modern technology and developments of Internet, VICTERS etc. | 179 | 33.52 | 355 | 66.48 |
| 07 | Have you ever seen Teachers of other subjects utilizing the possibilities of IT | 323 | 60.49 | 211 | 39.51 |

Table 8 shows that only 9.74% of students disagree with this. 46.44% students agree that they were provided facilities for using internet in their schools. But 80.71% of students disagree with this and that they were not provided facilities for using internet in the schools. 54.49% students agrees that teachers were able to teach and complete their syllabus of IT within the stipulated time. 45.50% students disagree with this. 30.34% of students agree that there are sufficient reference books on IT in their school library. But 69.66% of students disagree with this and they have the opinion that there is no adequate reference book in IT in the school library. 33.52% of students have expressed their view positively that while teaching IT teachers were tried to introduce latest developments in internet, VICTERS etc. But 66.48 % of students disagree with this and they have the opinion that teachers were not tried to introduce the latest development in internet VICTERS etc. 60.49% of students agreed that teachers in other subjects were utilizing the facilities and possibilities in IT. 39.51% of students expressed their disagreement in this and they have the opinion that teachers in other subjects were not utilizing the possibilities in IT.

The analysis of the data represented above shows some of the significant findings in the area of IT instruction. 90.26% of the students have the opinion that IT must be taught by separate qualified specialist teachers at high school level.80% of students have expressed their view that schools were not having internet facilities and they were denied the chance of utilizing the facilities in IT. 45.40% of students were of the opinion that teachers were not finishing their syllabus within the stipulated time. 69.66% of students have responded that schools were not having sufficient reference books in IT. 66.48% of students were expressed their view that IT teachers were not introduced latest development in internet, VICTERS etc to their students.

**Strength and limitations of IT instruction.**

To analyse the responses of students regarding the strength and limitations of software based IT instruction. The number and percentage of responses of secondary school students regarding the strength and limitations of IT instructions is presented as Table 9.

Table 9

*Responses of the students regarding strength and limitations of IT instruction*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Responses | | | |
| QNo: | Item | YES | % | NO | % |
| 08 | Do you agree with the opinion that the teaching of IT in VIII and IX standards are not give enough importance as that in X standard | 377 | 70.59 | 157 | 29.40 |
| 09 | Do you agree to the proposal that IT must be retained as a main subject in the curriculum | 460 | 86.14 | 74 | 13.86 |
| 10 | Are you giving equal importance to the study of IT when compared to other subjects in your school | 282 | 52.81 | 252 | 47.19 |
| 11 | Are you provided with enough practical classes for the IT subject | 223 | 41.76 | 311 | 58.24 |
| 12 | Have you ever felt the IT Practical examinations were more interesting when compared to the practicals of other subjects | 389 | 72.84 | 145 | 27.16 |
| 13 | Do you think studying of IT in High School has created a special interest towards the subject | 340 | 63.67 | 194 | 36.33 |

Table 9 reveals that 70.56% of students have of opinion that the teaching of IT in VIII and standards were not given much important as that of X standard. 29.40% of students disagree with this. 86.14% of students agreed the proposal that IT must be retained as a main subject in the curriculum. Only 13.86% students agreed on this statement. 52.81% of students responded that the school have given equal importance in IT and other subjects. 47.19% students disagree with this, that the schools were not given equal importance to IT and other subjects. 41.76% of students agree that enough practical experiences have given to them in the IT subjects. 58.24% of students disagreed with this; stating that they have not given enough practical experience in IT subjects. 72.84% of students responded that IT practical examinations were more interesting when compared to the practical of other subjects. 27.16% of students were not agreed upon their statement, stating that the practical classes were more interesting to them. 63.67% of students have responded positively that the studying of IT subjects in schools was created special interest among students. At the same time 36.33% of students were not agreed to this, and the study of IT subjects were not created any special interest in learning more in the subjects.

It is evident from the analysis that in VIII and IX, IT subjects are teaching seriously as that of X standard (70.59%). Majority of the students (86.14%) have of opinion that that IT must be retained as a main subject of study at secondary level. Practical classes given in IT subjects are comparably less to students (58.14%). The IT practical examinations were more interesting to students when compare to the practical’s in other subjects. It was also noted that the studying IT subjects in high school has created a special interest in them to study subject more. The above analysis reveals that there were areas of strength as well as limitation in the process and procedures of IT instruction.

**Challenges of IT instruction**

This part of the analysis is based on the responses of secondary school students about the challenges of IT instructions. The number and the percentage of responses of secondary school students regarding the challenges is presented as table 10.

Table 10:

*Responses of students about the challenges of IT instruction*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Responses | | | |
| Q.  No. | Item | YES | % | NO | % |
| 14 | Is there all facilities in the Schools to provide with enough practical experiences to students for the subject of I | 205 | 38.39 | 329 | 61.61 |
| 15 | Do you agree with the proposal that IT must be taught as a subject along with other subjects than being treated as a separate subject | 193 | 36.14 | 341 | 63.86 |
| 16 | Do the schools provide enough computers as to the number of students in practical classes of IT | 108 | 20.22 | 426 | 79.78 |
| 17 | Do IT serve as a useful aid for the teaching of the subjects of Mathematics and Physics | 372 | 69.66 | 162 | 30.34 |
| 18 | Do you have the opinion that the Labs of IT were provided with all necessary facilities for students | 293 | 54.87 | 241 | 45.13 |

Table 10 reveals that 38.39% of students agreed that there is an adequate facility in the school for giving practical experience in to IT students. But 61.61% of students were not agreeing this. 36.14% students of opinion that IT must be taught as a separate subject along with other subjects than being treated as separate subject. 63.86% of students disagreeing this. 20.22% of students agreeing that schools provide enough computers as to the number of students in the practical classes of IT. But 79.78% students disagreeing this stating that schools were not providing enough computers as to the number of students in practical classes of IT. 69.66% of students were agreed that IT will secure as a useful subjects for the teaching of mathematics and physics. 30.34% students disagree with this 54.87% students agreed to say that the laboratories of IT were provided with all necessary facilities for students. But, 45.13% of students disagree to this.

The above analysis reveals that 61.61% students have expressed their disagreement that the schools were not having adequate facilities for giving practical experiences in IT. 63.86% of students have the opinion that IT must be taught along with other subject and as a separate subject. 79.78% of students responded that schools are not providing sufficient number of computers in the practical classes of IT. 69.66% students have the opinion that IT subjects serve as a useful aid for teaching of mathematics and science. 45.13% students expressed their dissatisfaction that the IT laboratories were not provided adequate facilities for their practical experiences and hence these are of very serious concern in IT instruction and these are considered to be the challenges in the process and procedures of IT instruction.

**Responses of Secondary School Students on IT Examinations**

**Process and Procedure of IT Examinations**

To analyse the responses of students regarding the process and procedure of IT examination, data were consolidated and the number of responses and percentage is presented as Table 11.

Table 11

*Responses of students regarding process and procedure of IT examination*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Responses | | | |
| Q No. | Item | YES | % | NO | % |
| 19 | Do you agree with the proposal that as IT being a practical oriented subject, there is no need of theory exams at High School level | 259 | 48.50 | 275 | 51.49 |
| 20 | Do you had Unit tests conducted after the completion of every Unit in the syllabus | 199 | 37.26 | 335 | 62.74 |
| 21 | Do you have the opinion that there is no need of theory exams for IT | 348 | 65.17 | 186 | 34.83 |
| 22 | Were you given personal attention by the teachers during the practical examinations of IT | 299 | 55.99 | 235 | 44.00 |

Table 11 reveals that 48.50% of students agreed that has IT being a practical oriented subject there is no need of theory examination at High school level .51.49% of students had expressed their disagreement with this. 37.26% students agreed that after completion of every unit of syllabus, there was a unit test. At the same time 62.74% students were not agreed to this. 65.17% of students had of opinion that there is no need of a theory examination for IT. But 34.83% of students had expressed their disagreement. 55.99% of students agreed that they were given personal attention during the time of practical examination in IT. 44% of students have of opinion that they were not received personal attention during practical examination in IT.

An assessment of the results of analysis reveals that 51.49% students were not in favor of theory examination in IT, since IT is being a practical oriented subject. 62.74% of students have of opinion that there was no even a unit after the completion of every unit in the syllabus. 65.17% of students were expressed their disagreement in the content of theory examination in IT. 55.99% of students were agreed that they were individually attended during the practical examination in IT.

**Strength and limitations of IT examination**

To analyse the responses of students regarding strength and limitations of IT examination, data were consolidated and the number of responses and percentage is presented as Table .12

Table 12

*Responses of students regarding the strength and limitations of IT Examination*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Responses | | | |
| QNo. | Item | YES | % | NO | % |
| 23 | Do you agree that the schools are not giving enough importance to the IT examinations in VIII and IX standards | 415 | 77.71 | 119 | 22.28 |
| 24 | Do you agree with the proposal that the Soft exam syllabus must be included with matters related to Computer Science outside the Syllabus | 256 | 47.94 | 278 | 52.06 |
| 25 | Do the Soft examinations were conducted by teachers having enough ability and qualifications in the subject | 402 | 75.28 | 132 | 24,72 |

Table 12 reveals that 77.71% of students agreed that students are not giving enough importance to IT examination in 8th and 9th standards. 22.28% of students expressed their disagreement.47.94% students agrees that soft examination syllabus must also be included with matters related to computer science from outside the syllabus. 52.06% have the opinion that IT must be taught by separate specialist teachers in high schools.75.28% of students were of opinion that the IT soft examinations were conducted by teachers having enough ability and qualifications in the subject. At the same time 24.72% of students did not agreed to this.

It is evident that majority of students have of opinion that the IT examination conducted in 8th and 9th without any importance and seriousness. 75.28% of students were of opinion that teachers of IT subject were qualified and also able to teach successfully.

**Challenges of IT examination**

To analyse the responses of students regarding the challenges of IT examination collected data were consolidated and the number of responses and percentage is presented as Table 13.

Table 13

*Responses of students regarding the challenges in IT examinations*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Responses | | | |
| Q.  No. | Item | YES | % | NO | % |
| 26 | Do you think the seriousness of the IT examinations are lost with the practice of students who first attend the Soft examinations share and discuss the questions with the other students who are to appear for the exams after them | 280 | 52.43 | 254 | 47.57 |
| 27 | As the examination of IT is a software based one, do you agree there can be doubts on the authenticity of the valuation and result of the examinations | 244 | 45.69 | 290 | 54.31 |
| 28 | Do you have the opinion that it is difficult to complete Soft examinations of IT | 243 | 45.51 | 291 | 54.49 |

Table 13 reveals that 52.43% of students agreed that the seriousness and credibility of IT examination has lost due to the freedom for students in discussing and scoring the answers of IT soft examination question and at the same time 47.57% of students disagreed to this. It was seen that the authenticity of the valuation and results of the examination was doubtful to 45.69% of students ,but 54.31% of students are not accepting this.45.51% students have the opinion that it was difficult to complete the soft examinations of IT as per the schedule. At the same time 54.49% of students disagreed to this.

It was evident from the analysis that the credibility and seriousness of the IT examination has lost due the undue freedom given to students for discussing and sharing answers of the question. 52.43% of students agreed this aspect and 47.57% students disagreed to this. The authenticity of the valuation was doubtful to 45.69% students. 54.49 % of students have the opinion that it was difficult for them to complete soft examination of IT.

**CHAPTER V**

**SUMMARY OF FINDINGS, CONCLUSION AND SUGGESTIONS**

* **Study in Retrospect**
* **Summary of Major Findings**
* **Educational Implications of the Study**
* **Suggestions for Further Research**

**SUMMARY FINDINGS AND   
SUGGESTIONS**

The concluding part of the research report is presented in this chapter by summarizing the entire development of the study. It presents the study in retrospect, which includes the objectives and methodology. Major findings, educational implications and suggestions for further research also described in this chapter.

**The Study in Retrospect**

This chapter summarizes the entire study conducted. It presents an overall view of the major findings, conclusions, educational implications and suggestions for further research in the area.

**Restatement of the problem**

The main purpose of the study was to evolve problems and prospects of IT instruction and examination at secondary level students in the state of Kerala. Hence the problems under investigation is entitled as “Problems and prospects of IT instruction and Examination at secondary level under the IT@School project of Kerala”

**Objectives of the study**

The major objectives of the study are as follows:

* To identify the problems and challenges faced by the teachers and students in the IT instruction and examination at secondary school level.
* To analyse the process and procedures of IT instruction and Examination at secondary level conducted by IT @ school project of Kerala.
* To identify the major strength and limitations of IT instruction and examination at secondary level.
* To suggest better strategies for improving the overall quality of IT instruction and examination at secondary schools of Kerala.

**Methodology**

The present study is an attempt to analyse the problems and prospects of IT instruction and examination at secondary level. In order fulfil the objectives, the investigator followed descriptive survey method as the design of the study.

**Sample for the study**

The present study was conducted on a representative sample of 204 teachers and 534 students. Proper representations were given to the relevant categories such as gender and type of management. Stratified random sampling technique is used for the selection of sample.

**Tools used in the study**

In order to fulfill the said objectives following tools were used for collecting data:

* Questionnaire on IT instruction and soft examination for secondary school teachers (Sukanya and Saleem 2015).
* Questionnaire on secondary school IT instruction and soft examination for secondary school students (Sukanya and Saleem 2015).

**Statistical technique**

A percentage analysis was used to analyse the collected data and interpretation of results.

**Summary of the Major Findings**

Evaluating all the findings obtained by analysing the data through the viewpoints of multiple samples, major findings can be summarised as follows:

* Majority of the teachers (66.17%) have the opinion that separate teachers are needed for teaching IT in secondary schools. 90.26% of the students have the opinion that IT must be taught by separate qualified teachers at high school level. Most of the teachers responded that they have to spend much more time to prepare the class in IT which is an extra subject to them.
* 87.74% of teachers expressed that IT practical becomes more useful to students when compared to other subjects. Majority of teachers have the opinion regarding the less importance of IT in VIII and IX standard when compared with X standard.
* Regarding the CCE work, students are satisfied with the work of teachers. Most of the students (75.49%) are having the opinion that they have not much difficulties in managing IT subjects along with other subjects
* 90.68% of students were aware of internet facilities and using that facility in teaching learning activities.
* 84.31% teachers have the opinion that, the present school facilities are sufficient for teaching IT subject and IT should be taught compulsory at secondary level.
* 57.35% teachers have the opinion that the training received by them is insufficient for handling classes in the subject of IT.
* 98.04% of teachers responded that IT subjects more useful in teaching the related subjects such as mathematics and science.
* A good percentage of teachers (93.14%) opined for the need of updating IT books in tune with the day to day changes in the subjects concerned.
* Teachers expressed their view that the allotment of 10 marks for the theory examination is adequate.
* Most of the teachers expressed their view that additional information from outside the prescribed syllabus also needs to be included in the soft examination.
* Teachers feel difficulty in completing the lab installation jobs for the conduction of soft examination. 64.22% of teachers have opined that the IT examination 8th and 9th are not conducting systematically and seriously.
* 58.33% of teachers responded that the seriousness and truthfulness in the soft examination have lost among students due to the freedom that they are getting to share the questions.
* 69.66% of students have responded that schools were not having sufficient reference books in IT. They revealed that IT teachers were not introduced latest development in internet VICTERS etc. to their students.
* 86.14% of students have opined that IT must be retained as a main subject of study at secondary level and IT subjects serve as a useful aid for teaching of mathematics and physics.
* 55.59% students were responded that they were not given personal attention by the teachers during the IT practical examination and around 50% of students opined that the authenticity of the valuation is doubtful.

**Conclusion**

The study reveals that most of the teachers are facing difficulties in handling IT classes. Almost all teachers agreed with the usefulness of the IT practicals. Most of the teachers have an opinion that separate teachers are required for teaching IT subject’s .That majority of the students are aware of the possibilities and limitations of the internet. Majority responded that they are making use of IT facilities in the teaching learning process and students are also giving necessary importance to IT subjects. But it is clearly evident from the analysis of data that the most of the schools are not having adequate facilities for teaching IT. And the training received by the teachers are not sufficient for the conduct of practicals in IT. Teachers were able to solve the technical problems that may arise in the laboratory, but the numbers of computers available in the IT lab were comparably very less. Most of the teachers agreed that IT subjects were more useful in teaching and learning mathematics and science. They pointed out the need for updating IT books in tune with changes in the subjects concerned. Teachers have opinion that the IT examination in VIII and IX are not conducting systematically and seriously. There are challenges and issues to be faced in the smooth conduct of IT soft examination. Inadequate ICT facilities in the institutions are one of the major challenges in IT instruction and examination. Classes with large number of pupils are another challenge to be faced in the conduct of IT soft examination.

Students were expressed their views that IT teachers were not introduced latest development in internet VICTERS etc. to their student and schools were not having sufficient reference books in IT.. Majority of the students have the opinion that that IT must be retained as a main subject of study at secondary level. Students have the opinion that IT subjects serve as a useful aid for learning mathematics and physics. Students were agreed that they were individually attended during the practical examination in IT.

**Educational Implications of the study**

The findings of the study highlights some of the salient problems as well as prospects in IT instruction and examination at secondary level. In the light of the above findings of study, the major implications of the study as follow:

* From the very outset of the findings of the study, it was seen the inadequacy and deficiency, prevailing in the institutions in the provision of physical facilities for IT instruction at secondary level. Lacks of necessary class room for IT lab for doing practicals, proper furniture, etc. were noted. Hence for the better IT instruction the above mentioned facilities to be provided in the secondary schools. The concerned authorities should take immediate initiative to overcome such deficiencies for imparting successive IT instruction.
* There must be an administrative mechanism to look into such issues and to rectify the limitation’s urgently. The IT instructors and teachers should report the in adequacies to the head of the institution for bestowing their immediate attention. If the follow up programs fails, the institutions have to produce low quality products.
* Many of the schools are not having sufficient number of computers required as per the number of students in the class room and this will negatively effecting the conduct of practical’s. Since, IT instruction is a practical oriented subject of study this has to be taken care of by the IT teachers and the concerned authorities.
* In the light of the research findings the functioning of the school libraries where not satisfactory. The role of libraries in School is so significant for strengthening and developing knowledge and getting up to date in formation and for developing intellectual abilities. The school authorities and the District Panchayath have to take initiative in strengthening school libraries including e-content and e- libraries.
* In a fast developing subject, the IT teachers have to be well aware of the developments in the subject and they have to be up-to-date and abreast. Hence teachers have to be given orientation and refresher classes in IT subjects. The authorities have to be taken initiative for conducting orientation courses to its teachers.
* Many of the IT teachers are not well aware of the IT curriculum and syllabus at secondary level. The school authorities should take necessary steps for getting the copies of the syllabus and text books to students and teachers at the beginning of the academic year.
* Teachers to be given orientation classes for the proper conduct of IT soft examination. It was seen from the findings that many of the teachers are not properly trained in the conduct IT soft examination. The inabilities of the teachers to conduct the IT examination systematically transparently, seriously and confidentially, were identified in the findings of the study. Hence, the authorities should take initiative in giving orientation classes to its teachers in the latest trends in IT instruction and examination.
* Considering the request and opinion of teachers and students, separate teachers who are qualified in the subject may be appointed exclusively for teaching IT subject in the schools and this will help to excel in the quality in the teaching learning process as well as the conduct of IT examination at secondary level.
* Steps are to be taken by the authorities to maintain the quality of IT instruction at secondary level and thereby keeping the standard of IT soft examination. The concerned authorities should take initiative for conducting proper evaluation and proper monitoring. In the field of IT instruction and examination in keeping transparency, confidentiality and credibility in IT examination at secondary level.
* In a informatics era teachers and students generally welcomes IT as a compulsory subject at secondary level and this have to motivate students, in learning further at higher level. As a practical oriented subject, the concerned authorities have to take initiative for giving more qualitative, competency based, skill oriented IT instruction In both theory and practical and there by the IT instruction and examination to be strengthened further at secondary level.

**Suggestions for Further Research**

The present investigation is only an attempt to explore the problems and prospects of secondary school IT instruction and examination based on the sample selected from Kozhikode and Malappuram districts. For the present study the investigator considered teachers and students as its sample. Naturally; there is wide scope for further studies to follow. Based on the findings of the study the investigator suggests the following areas in which future researches are to be carried out.

* A study on IT instruction in teacher training institution of Kerala can be conducted
* A comparative study on IT education of Kerala with other states can be under taken
* A comparative study can be conducted about IT education in various levels of education
* A comparative study can be conducted among secondary and higher secondary teachers regarding the use of computer in education
* A study can be designed focusing on specific area about the use of computer in education
* A comparative study can be conducted among teachers and non-teachers regarding the use of computer in education
* The present study can be extended to a state wide sample

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**APPENDICES**

**APPENDIX I**

**FAROOK TRAINING COLLEGE CALICUT**

**Research Department of Education**

**Questionnaire on Secondary School IT Instruction and Soft Exam   
(For Teachers)**

**Dr. T. Mohamed Saleem Sukanya Rani.P**

Asst. Professor & Research Guide M. Ed Student.

This is a questionnaire related to IT instruction and examination at secondary level in the state of Kerala. This tool includes a series of statements related to IT instruction and examination. Please, read each of the item in the questionnaire and offer your responds in the column by marking (YES/NO) against each item. Your responses will be used for research purpose only.

01 Do you have the opinion that instead of studying IT as a separate subject at HS level, its better to integrate with other subjects.

Yes □ No □

02 Are the students perfectly executing the CCE activities in IT.

Yes □ No □

03 Do you agree with the statement that IT studies in 8th and 9th classes are not considered as important as that in tenth standard.

Yes □ No □

04 During the IT practical sessions, is it possible to pay attention to each student individually.

Yes □ No □

05 When compared to other subjects does the IT practical become more useful to the students.

Yes □ No □

06 Do you feel the difficulty in managing IT and your subject concurrently.

Yes □ No □

07 Do you have the opinion that separate teachers are required for IT subjects

Yes □ No □

08 Do you make special preparations for taking IT classes

Yes □ No □

09 Do you have the opinion that the presentation of It lessons are harmonious to their evaluation methods

Yes □ No □

10 Are students giving necessary importance of IT subject compared to other subjects.

Yes □ No □

11 Is the present school facility sufficient for providing

Yes □ No □

12 Do you have the opinion that the training received by you is sufficient in conducting IT practical’s.

Yes □ No □

13 Do you have the opinion that IT should be maintained as a mandatory subject.

Yes □ No □

14 Do you make the use of possibilities of IT like presentation software for teaching and learning activities of other subjects.

Yes □ No □

15 Are the student made aware of the possibilities and limitations of internet

Yes □ No □

16 Do you have the opinion that the relevant IT syllabus encourages the students for higher studies in the subject.

Yes □ No □

17 Are you able to solve the technical problems that may arise in the lab.

Yes □ No □

18 Is it possible to obtain sufficient numbers of computers depending on the number of students in practical classes.

Yes □ No □

19 Do you have the opinion that the teachers handling IT needs to do other courses in addition to in service training.

Yes □ No □

20 Do you have the anxiety that job opportunities of teachers are diminishing due to computerization.

Yes □ No □

21 Do you present other subjects in classes by relating to IT

Yes □ No □

22 Do you find it possible to complete the lessions in correct time as per the prescribed syllabus

Yes □ No □

23 Are you able to make use of modern facilities like VICTERS a part of IT learning

Yes □ No □

24 Do you have the opinion that IT books should be frequently updated as the subject undergoes day to day changes

Yes □ No □

25 Do you impart special training for students who are backward in IT

Yes □ No □

26 Do you have opinion that IT subject is more useful in teaching maths and science subjects

Yes □ No □

27 Do you have the opinion that the evaluation of other subjects should be changed to the model for IT

Yes □ No □

28 Being a practical oriented subject, do you agree with the statement that theory exam is not required for IT at HS level.

Yes □ No □

29 Do you have the opinion that additional information outside the prescribed computer syllabus also needs to be included in soft exam.

Yes □ No □

30 Do you agree with the conduction of theory exams using soft exam method.

Yes □ No □

31 Do you feel difficulty in completing the lab installation jobs for the conduction of soft exam

Yes □ No □

32 Do you have the opinion that the allotment of 10 marks for the thoery exam is adequate

Yes □ No □

33 Do you have the opinion that the current question patterns of theory exams should be changed

Yes □ No □

34 Do you have the opinion that IT exams of classes VII & IX are not given enough importance

Yes □ No □

35 Do you have the opinion that teachers generally show

Yes □ No □

36 Do you feel that trust of soft exam is ruined as the students initially attending the exam shares questions with others

Yes □ No □

37 Do you agree with the statement that being a software based exam can create doubts in the trustworthiness of result

Yes □ No □

38 Are soft exams becoming cause for inducing new doubts and more learning possibilities in students.

Yes □ No □

39 Do you have the opinion that the conduction of IT exam in institution with more students is difficult.

Yes □ No □

40 Are the ICT facilities in school adequate for the conduction of soft exam

Yes □ No □

41 Do you find it possible to resolve the technical difficulties that may incur between It soft exam

Yes □ No □

**APPENDIX II**

**FAROOK TRAINING COLLEGE CALICUT**

**Research Department of Education**

**Questionnaire on Secondary School IT Instruction and Soft Exam   
(For Teachers)**

**Dr.T.Mohamed Saleem Sukanya Rani.P**

Asst. Professor & Research Guide M Ed Student.

|  |  |  |
| --- | --- | --- |
| General Data | | |
| Your Name |  | Male/Female |
| Name of School |  | Govt./Aided |

sslkvIqÄ Xe-¯nse \n§-fpsS sF.Sn ]T-\-hp-ambn \_Ô-s¸« {]kvXm-h-\-I-fmWv NphsS \ÂIn-bn-cn-¡p-¶-Xv. {]kvXm-h-\-IÄ¡pÅ \n§-fpsS (Yes/No)✓AS-bmfw D]-tbm-Kn¨v tcJ-s¸-Sp-¯p-I. \n§-fpsS {]Xn-I-c-W-§Ä Kth-jW Bh-iy-§Ä¡v th­n am{Xta D]-tbm-Kn-¡p-I-bpÅq F¶v Dd-¸p-\ÂIp-¶p.

1. HS Xe-¯nÂ IT Hcp {]tXyI hnj-b-ambn ]cn-K-Wn-¡p-¶-Xn\p ]Icw, aäp hnj-b-§-fp-ambn tNÀ¯v ]Tn-¸n-¡p-I-bmWv \ÃXv F¶ A`n-{]m-b-apt­m Yes 🗆 No 🗆

2. sF.Sn bnse CCE {]hÀ¯-\-§Ä Ip«n-IÄ IrXy-ambn sNbvXv hcp-¶pt­m

Yes 🗆 No 🗆

3. VIII, IX¢mkp-I-fnse sF.Sn ]T-\-¯n\v ]¯mw ¢mknse A{X {]m[m\yw \ÂIp-¶n-Ã F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

Yes 🗆 No 🗆

4. sF.Sn {]mIvSn-¡Â ka-b-§-fnÂ Hmtcm hnZymÀ°n-tbbpw {]tXy-I-ambn {i²n-¡m³ Ign-bm-dpt­m

Yes 🗆 No 🗆

5. aäp hnj-b-§-fp-ambn Xmc-Xayw sN¿pt¼mÄ sF.Sn hnj-b-¯nsâ {]mIvSn-¡Â hnZymÀ°n-IÄ¡v IqSp-XÂ KpW-{]-Z-am-Ip-¶pt­m

Yes 🗆 No 🗆

6. sF.-Sn.bpw Xm¦-fpsS hnj-bhpw Hcp-an¨v sIm­p t]mIp-¶-XnÂ \_p²n-ap«v A\p-`-h-s¸-Sm-dpt­m

Yes 🗆 No 🗆

7. sF.-Sn.-hn-j-b-¯n\v am{X-ambn {]tXyIw A[ym-]-IÀ thW-sa¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

8. sF.Sn ¢msk-Sp-¡p-¶-Xn-\mbn {]tXyI X¿m-sd-Sp¸v \S-¯m-dpt­m

Yes 🗆 No 🗆

9. sF.Sn ]mT `mK-§-fpsS Ah-X-cWw aqey-\nÀWb coXn-bp-ambn tbmPn-¡p-¶-Xm-¡p-¶-Xm-W-sW¶v \n§Ä¡v A`n-{]mbw Dt­m

Yes 🗆 No 🗆

10. aäp hnj-b-§-fp-ambn Xmc-Xayw sN¿pt¼mÄ Ip«n-IÄ sF.Sn hnj-b-¯n\p th­{X {]m[m\yw \ÂIp-¶p-sh¶v tXm¶n-bn-«pt­m

Yes 🗆 No 🗆

11. Ip«n-IÄ¡v th­{X coXn-bnÂ {]mIvSn-¡Â ¢mkv \ÂIm³ \ne-hn-epÅ kvIqÄ kml-Ncyw ]cym-]vX-am-tWm

Yes 🗆 No 🗆

12. sF.-Sn. {]mIvSn-¡Â {]hÀ¯-\-§Ä kwL-Sn-¸n-¡p-hm³ Xm¦Ä¡v e`n-¡p¶ ]cn-io-e\w ]cym-]vX-amWv F¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

13. sF.Sn Hcp \nÀ\_-ÔnX hnj-b-ambn \ne-\nÀ¯-W-sa¶ A`n-{]m-b-t¯mSv tbmPn-¡p-¶pt­m

Yes 🗆 No 🗆

14. Presentation Softwaret]mse-bpÅ sF.Sn bpsS km[y-X-IÄ aäp hnj-b-§-fpsS ]T-\-t\_m-[-\-{]-hÀ¯-\-§Ä¡mbn D]-tbm-K-s¸-Sp-¯m-dpt­m

Yes 🗆 No 🗆

15. CâÀs\-änsâ km[y-X-Ifpw ]cn-an-Xn-Ifpw Ip«n-Isf t\_m[y-s¸-Sp-¯m-dpt­m

Yes 🗆 No 🗆

16. \ne-hnse sF.Sn kne-\_kv Ip«n-IÄ¡v Cu hnj-b-¯nÂ D]-cn-]-T-\-¯n\v t{]mÕm-l\w \ÂIp-sa¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

17. em\_nÂ AXym-hiyw D­m-tb-¡m-hp¶ kmt¦-XnI {]iv\-§Ä ]cn-l-cn-¡m³ Xm¦Ä {]m]vX-\mtWm

Yes 🗆 No 🗆

18. {]mIvSn-¡Â ¢mkp-I-fnÂ Ip«n-I-fpsS F®-¯n-\-\p-k-cn¨v Computer e`y-am-¡m³ km[n-¡p-¶pt­m

Yes 🗆 No 🗆

19. bYmÀ°-¯nÂ asämcp hnj-b-¯nsâ A[ym-]-I³ F¶ \ne-bnÂ sF.Sn hnjbw Hcp A[n-I-\_m-[y-X-bmbn Xm¦Ä¡v A\p-`-h-s¸-«n-«pt­m

Yes 🗆 No 🗆

20. Computer hÂ¡-cWw aqew A[ym-]-I-cpsS sXmgnÂ Ipd-bp¶p F¶ Bi-¦-bpt­m

Yes 🗆 No 🗆

21. aäp hnj-b-§Ä sF.Sn bpambn \_Ô-s¸-Sp¯n ¢mknÂ Ah-X-cn-¸n-¡m-dpt­m

Yes 🗆 No 🗆

22. X¶n-cn-¡p¶ kne-\_kv {]Imcw ]mT-`m-K-§Ä IrXy-k-a-b¯v ]Tn-¸n¨v XoÀ¡m³ km[n-¡p-¶pt­m

Yes 🗆 No 🗆

23. VICTERS t]mepÅ B[p-\nI kwhn-[m-\-§sf sF.Sn ]T-\-¯nsâ `mK-am-¡m³ Xm¦Ä¡v km[n-¡p-¶pt­m

Yes 🗆 No 🗆

24. A\p-Zn\w amä-§Ä¡v hnt[-b-am-Ip¶ hnjbw F¶ \ne-bnÂ sF.Sn ]pkvX-I-§Ä CS-¡nsS update sN¿Ww F¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

25. sF.Sn hnj-b-¯nÂ ]nt¶m¡w \nÂ¡p¶ Ip«n-IÄ¡v {]tXyI ]cn-io-e\w \ÂIm-dpt­m

Yes 🗆 No 🗆

26. IW-¡v, kb³kv F¶o hnj-b-§-fpsS t\_m[-\-¯n\v sF.Sn hnjbw IqSp-XÂ {]tbm-P-\-{]-Z-amWv F¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

27. aäp hnj-b-§-fpsS aqey-\nÀ®bw sF.Sn amXr-I-bn-te¡v amäWw F¶ A`n-{]m-b-ap-t­m

Yes 🗆 No 🗆

28. Hcp {]mIvSn-¡Â A[n-jvTnX hnjbw F¶ \ne¡v HS Xe-¯nÂ sF.Sn ¡v Xnbdn ]co£ th­ F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

Yes 🗆 No 🗆

29. Hcp {]mIvSn-¡Â A[n-jvTnX hnjbw F¶ \ne¡v HS Xe-¯nÂ IT ¡v Xnbdn ]co£ th­ F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

Yes 🗆 No 🗆

30. Xnbdn ]co£ tkm^väv ]co£ coXn-bnÂ kwhn-[m-\n-¨-Xn-t\mSv Xm¦Ä tbmPn-¡p-¶pt­m

Yes 🗆 No 🗆

31. tkm^väv ]co-£¡v th­ em\_v C³Ì-te-j³ tPmen-IÄ ]qÀ¯o-I-cn-¡p-¶-XnÂ \_p²n-ap-«p-IÄ D­m-hm-dpt­m

Yes 🗆 No 🗆

32. Xnbdn ]co-£¡v A\p-h-Zn¨ 10 amÀ¡v ]cym-]vX-apt­m

Yes 🗆 No 🗆

33. Xnbdn ]co-£-bpsS \ne-hnse tNmZy ]mtä¬ amdWw F¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

34. VIII, IX ¢mkp-I-fnse sF.Sn ]co-£-IÄ¡v th­{X Kuchw \ÂIp-¶nÃ F¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

35. tkm^väv ]co-£-I-tfmSv A[ym-]-IÀ s]mXpsh XmÂ]cyw ImWn-¡p-¶nÃ F¶ A`n-{]mbw Dt­m

Yes 🗆 No 🗆

36. tkm^vddv ]co-£-bnÂ BZyw attend sN¿p¶ Ip«n-IÄ tNmZy-§Ä aäp-Å-hÀ¡v ]¦v sh¡p-¶XvsIm­v ]co-£-bpsS hnizm-kyX XI-cp-¶p-sh¶v tXm¶p-¶pt­m

Yes 🗆 No 🗆

37. tkm^vävshbÀ A[n-jvSnX ]co-£-bm-bXvsIm­v ^e-¯nsâ hnizm-ky-X-bnÂ kwibw D­mhmw F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

Yes 🗆 No 🗆

38. tkm^väv ]co-£-IÄ Ip«n-I-fnÂ ]pXnb kwi-b-§Ä¡pw IqSp-XÂ ]T\ km[y-X-IÄ¡pw Imc-W-am-hm-dpt­m

Yes 🗆 No 🗆

39. IqSp-XÂ hnZymÀ°n-IÄ DÅ hnZym-e-b-§-fnÂ sF.Sn ]co£ \S-¯n¸v {]bm-k-I-c-amWv F¶ A`n-{]m-b-apt­m

Yes 🗆 No 🗆

40. kvIqfnse ICT kuI-cy-§Ä Soft ]co£m \S-¯n-¸n\v ]cym-]m-X-amtWm

Yes 🗆 No 🗆

41. sF.Sn tkm^väv ]co-£-¡n-S-bnÂ ht¶-¡m-hp¶ kmt¦-XnI XI-cm-dp-IÄ ]cn-l-cn-¡m³ km[n-¡p-¶pt­m

Yes 🗆 No 🗆

**APPENDIX III**

**FAROOK TRAINING COLLEGE CALICUT**

**Research Department of Education**

**Questionnaire on Secondary School IT Instruction and Soft Exam   
(For Students)**

**Dr. T. Mohamed Saleem Sukanya Rani.P**

Asst. Professor & Research Guide M Ed Student.

This is a questionnaire related to IT instruction and examination at secondary level in the state of Kerala. This tool includes a series of statements related to IT instruction and examination. Please, read each of the item in the questionnaire and offer your responds in the column by marking (YES/NO) against each item. Your responses will be used for research purpose only.

01 Do you have the opinion that IT must be taught by separate specialist teachers in High Schools

02 Do you have the opinion that the evaluation scale of other subjects must be changed to the way as that of the IT subject

03 Are you provided with separate classes on the possibilities and use of Internet in your school

04 Were the teachers were able to teach and complete the syllabus of IT within the stipulated time

05 Do you library have enough reference books on IT

06 Do you have the opinion that your teachers have introduce you properly with the modern technology and developments of Internet, VICTERS etc

07 Have you ever seen Teachers of other subjects utilizing the possibilities of IT

08 Do you agree with the opinion that the teaching of IT in VIII and IX standards are not give enough importance as that in X standard

09 Do you agree to the proposal that IT must be retained as a main subject in the curriculum

10 Are you giving equal importance to the study of IT when compared to other subjects in your school

11 Are you provided with enough practical classes for the IT subject

12 Have you ever felt the IT Practical examinations were more interesting when compared to the practical’s of other subjects

13 Do you think studying of IT in High School has created a special interest towards the subject

14 Is there all facilities in the Schools to provide with enough practical experiences to students for the subject of IT

15 Do you agree with the proposal that IT must be taught as a subject along with other subjects than being treated as a separate subject

16 Do the schools provide enough computers as to the number of students in practical classes of IT

17 Do IT serve as a useful aid for the teaching of the subjects of Mathematics and Physics

18 Do you have the opinion that the Labs of IT were provided with all necessary facilities for students

19 Do you agree with the proposal that as IT being a practical oriented subject, there is no need of theory exams at High School level

20 Do you had Unit tests conducted after the completion of every Unit in the syllabus

21 Do you have the opinion that there is no need of theory exams for IT?

22 Were you given personal attention by the teachers during the practical examinations of IT

23. Do you agree that the school are not giving enough importance to the IT examination in VIII and IX standards

24 Do the Soft examinations were conducted by teachers having enough ability and qualifications in the subject

25. Do you agree with the proposal that the Soft exam syllabus must be included with matters related to Computer Science outside the Syllabus

26 Do you think the seriousness of the IT examinations are lost with the practice of students who first attend the Soft examinations share and discuss the questions with the other students who are to appear for the exams after them

27 As the examination of IT is a software based one, do you agree there can be doubts on the authenticity of the valuation and result of the examinations

28 Do you have the opinion that it is difficult to complete Soft examinations of IT

**APPENDIX IV**

**FAROOK TRAINING COLLEGE CALICUT**

**Research Department of Education**

**Questionnaire on Secondary School IT Instruction and Soft Exam (For Students)**

**Dr. T. Mohamed Saleem Sukanya Rani.P**

Asst. Professor & Research Guide M Ed Student.

sslkvIqÄ Xe-¯nse \n§-fpsS sF.Sn ]T-\-hp-ambn \_Ô-s¸« {]kvXm-h-\-I-fmWv NphsS \ÂIn-bn-cn-¡p-¶-Xv. {]kvXm-h-\-IÄ¡pÅ \n§-fpsS (Yes/No)✓AS-bmfw D]-tbm-Kn¨v X¶n-cn-¡p¶ Response SheetÂ tcJ-s¸-Sp-¯p-I. \n§-fpsS {]Xn-I-c-W-§Ä Kth-jW Bh-iy-§Ä¡v th­n am{Xta D]-tbm-Kn-¡p-I-bpÅq F¶v Dd-¸p-\ÂIp-¶p.

1. sF.Sn hnj-b-¯n\v am{X-ambn {]tXyIw A[ym-]-IÀ thW-sa¶ A`n-{]m-b-apt­m

2. aäp hnj-b-§-fpsS aqey-\nÀ®bw sF.Sn amXr-I-bn-te¡v amäWw F¶ A`n-{]m-b-ap-t­m

3. Câ-s\-änsâ km[y-X-Isf Ipdn¨v {]tXyI ¢mkp-IÄ \ÂIm-dpt­m

4. ]mT-`m-K-§Ä IrXy-k-a-b¯v Xs¶ ]Tn-¸n¨v XoÀ¡p-hm³ A[ym-]-IÀ¡v km[n-¡p-am-bn-cp-¶p-sh¶ A`n-{]m-b-apt­m

5. sF.Sn bnÂ Ahiyw th­ d^-d³kv ]pkvX-I-§Ä kvIqÄ sse{\_-dn-bnÂ e`y-am-bn-cp-t¶m

6. CâÀs\äv VICTERS XpS-§nb B[p-\nI kt¦-X-§Ä \n§Ä¡v A[ym-]-IÀ th­-hn[w ]cn-N-b-s¸-Sp¯n F¶ A`n-{]m-b-apt­m

7. aäp hnj-b-§Ä ]Tn-¸n-¡p¶ A[ym-]-IÀ sF.-Sn-bpsS km[y-X-IÄ D]-tbm-K-s¸-Sp-¯m-dpt­m

8. VIII, IX¢mkp-I-fnse sF.Sn ]T-\-¯n\v ]¯mw ¢mknse A{X {]m[m\yw \ÂIp-¶n-Ã F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

9. sF.Sn Hcp \nÀ\_-ÔnX hnj-b-ambn \ne-\nÀ¯-W-sa¶ A`n-{]m-b-t¯mSv tbmPn-¡p-¶p-t­m

10. aäp hnj-b-§sf t]mse-¯s¶ sF.Sn ¡v \n§Ä Xpey-{]m-[m\yw \ÂIn-bn-cp¶p F¶v tXm¶p-¶p-t­m

11. ]cym-]vX-amb coXn-bnÂ {]mIvSn-¡Â ¢mkp-IÄ e`y-am-bn-cp¶p F¶ A`n-{]m-b-apt­m

12. aäp hnj-b-§-fp-ambn Xmc-Xayw sN¿pt¼mÄ sF.Sn {]mIvSn-¡Â IqSp-XÂ XmÂ]-cy-ap-Å-Xmbn A\p-`-h-s¸-«n-«pt­m

13. sslkvIq-fnse sF.Sn ]T\w B hnj-b-t¯mSv IqSp-XÂ XmÂ]cyw tXm¶m³ Imc-W-ambn F¶v tXm¶p-¶pt­m

14. Ip«n-IÄ¡v th­{X coXn-bnÂ {]mIvSn-¡Â ¢mkv \ÂIm³ \ne-hn-epÅ kvIqÄ kml-Ncyw ]cym-]vX-am-tWm

15. HS Xe-¯nÂ IT Hcp {]tXyI hnj-b-ambn ]cn-K-Wn-¡p-¶-Xn\p ]Icw, aäp hnj-b-§-fp-ambn tNÀ¯v ]Tn-¸n-¡p-I-bmWv \ÃXv F¶ A`n-{]m-b-apt­m

16. {]mIvSn-¡Â ¢mkp-I-fnÂ Ip«n-Isf F®-¯n-\-\p-k-cn¨v Computer e`y-am-¡m³ km[n-¡p-¶pt­m

17. IW-¡v, kb³kv F¶o hnj-b-§-fpsS t\_m[-\-¯n\v sF.Sn hnjbw IqSp-XÂ {]tbm-P-\-{]-Z-amWv F¶ A`n-{]m-b-apt­m

18. sF.Sn em\_nÂ {]mIvSn-¡Â sNbvXp XoÀ¡m³ th­ kuI-cy-§Ä \Ã-Xm-bn-cp-¶p-sh¶ A`n-{]m-b-ap-t­m

19. Hcp {]mIvSn-¡Â A[n-jvTnX hnjbw F¶ \ne¡v HS Xe-¯nÂ sF.Sn ¡v Xnbdn ]co£ th­ F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

20. Hmtcm ]mT-`m-K-§fpw Ign-ªmÂ bqWnäv sSÌv \S-¯m-dpt­m

21. sF.Sn ¡v Fgp¯v ]co£ th­ F¶ A`n-{]-b-apt­m

22. {]mIvSn-¡Â ]co£m thf-I-fnÂ A[ym-]-I-cnÂ\n¶v hyàn-]-c-amb {i² e`n-¡m-dpt­m

23. Computer kw\_-Ô-amb kne-\_-kn\v ]pd-¯pÅ Imcy-§Ä IqSn Bh-iy-sa-¦nÂ tkm^väv ]co-£-bnÂ DÄs¸-Sp-¯-W-sa¶ A`n-{]mbw Dt­m?

24. VIII, IX ¢mkp-I-fnse sF.Sn ]co-£-IÄ¡v th­{X Kuchw \ÂIp-¶nÃ F¶ A`n-{]m-b-apt­m

25. th­{X {]m]vXn-bpÅ A[ym-]-IÀ Xs¶-bm-bn-cp-¶pthm tkm^väv ]co-£¡v t\XrXzw \ÂIn-bn-cp-¶-Xv

26. tkm^vddv ]co-£-bnÂ BZyw attend sN¿p¶ Ip«n-IÄ tNmZy-§Ä aäp-Å-hÀ¡v ]¦v sh¡p-¶XvsIm­v ]co-£-bpsS hnizm-kyX XI-cp-¶p-sh¶v tXm¶p-¶pt­m

27. tkm^vävshbÀ A[n-jvSnX ]co-£-bm-bXvsIm­v ^e-¯nsâ hnizm-ky-X-bnÂ kwibw D­mhmw F¶-Xn-t\mSv tbmPn-¡p-¶pt­m

28. tkm^väv ]co-£-IÄ ]qÀ¯o-I-cn-¡m³ Ffp-¸-aÃ F¶ A`n-{]m-b-apt­m

**APPENDIX V**

**RESPONSE SHEET**

Name of the student :

Male/Female :

Aided /Govt. :

Name of School :

| Question Number | Yes | No |
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