

**An Evaluation of the Effectiveness of
Digital Infrastructure for Knowledge Sharing
(DIKSHA) Programme in the English Reader of
Standard IX of Kerala**

Dissertation
*submitted to the University of Calicut
in partial fulfillment of the requirements for the Degree of*
MASTER OF EDUCATION

by
GREESHMA. M



**FAROOK TRAINING COLLEGE
RESEARCH CENTRE IN EDUCATION
UNIVERSITY OF CALICUT
2019 - 2021**

DECLARATION

I, **GREESHMA. M**, do hereby declare that this dissertation entitled, “**AN EVALUATION OF THE EFFECTIVENESS OF DIGITAL INFRASTRUCTURE FOR KNOWLEDGE SHARING (DIKSHA) PROGRAMME IN THE ENGLISH READER OF STANDARD IX OF KERALA**” is a record of original research work done by me under the supervision and guidance of **MOHAMMED SAREEF**, Assistant Professor in Education, Farook Training College, Kozhikode and has not been submitted by me for the award of a Degree, Diploma, Title or Recognition before.

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CERTIFICATE

I, **MOHAMMED SAREEF**, do hereby certify that this dissertation entitled “**AN EVALUATION OF THE EFFECTIVENESS OF DIGITAL INFRASTRUCTURE FOR KNOWLEDGE SHARING (DIKSHA) PROGRAMME IN THE ENGLISH READER OF STANDARD IX OF KERALA**” is a record of bonafide study and research carried out by **GREESHMA. M** of M.Ed. Programme (2019-2021) under my supervision and guidance and has not been submitted by her for the award of a Degree, Diploma, Title or Recognition before.

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CHAPTER I

INTRODUCTION

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- ◆ Need and Significance of the Study
 - ◆ Statement of the Problem
 - ◆ Definition of Key Terms
 - ◆ Variables of the Study
 - ◆ Objectives of the Study
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CHAPTER 1

INTRODUCTION

Education means the modification of behaviour. It is an activity or process that modifies the behaviour of a human being from instinctive to human behaviour. Education is the deliberate and systematic influence exerted by the mature person upon the immature through instruction, discipline, and harmonious development of physical, intellectual, aesthetic, social, and spiritual powers of human beings according to individual and social needs and directed towards the union of the educand with his creator as the end. (Redden 1956, P. 21)

Today human beings are living in a knowledge-based society and education stands as a disseminator of knowledge and information to the man and society. Hence, education has a very vital role in the transformation of the individual in particular and nation in general. . Therefore, education is a means for building the destiny of any nation. The Educational system whether it be a formal system or the informal system or the non-formal system is the continuous means to disseminate the knowledge and information in a certain quantum of outcomes. The evolution of the knowledge and information has taken place since the dawn of the human civilization and due to this rapid expansion of knowledge and information, the 21st century has triggered with various tremendous challenges for the use of modern technologies for the acquisition of this fast-growing knowledge and information.

Education being a total of all experiences processed by a person while developing their abilities, attitudes and other forms of behaviour of positive value

in the society in which they lives, should not force every child to pass through the same steps in their learning experience at the same pace. The higher achiever will move faster in learning and the underachievers would take more time. Children have their ways of learning. Some children learn better with different learning materials than by merely listening to an inspirational talk by the tutor. The style of learning may also change according to age. The child learns best if they use senses in acquiring knowledge along with technologies that promote the teaching-learning process. Thus, the technologies that promote teaching learning process was termed as Educational Technology.

Educational technology is comprised of two words 'Education' and 'Technology'. 'Education' is the means of the development of the power of adaptation to a social environment whereas, 'Technology' means a science of techniques and methods of getting things done related to any art, science or to a particular profession. The term Technology implies the application of science to art. Technology refers to two aspects - The theoretical based on ideas and The Practices based on putting ideas into practice. Therefore, any technology used for the acceleration and facilitation of educational processes with certain objectives then that technology is called educational technology. Science and technology have always been instrumental in the process of up-gradation of human look. The same technique of infusing Science and technology into the field of education has created wonders.

The use of any sort of Technology in the field of education can be dated back to the time when man started acquiring knowledge. Knowledge as he

acquired the ability to speak and express feelings meaningfully. Once he began to communicate and developed memory. The developments of memory help him to express his own experiences and that he learned from the experiences of others. Gradually man could establish relationships or differences between new and old knowledge and the concepts such as bigger and smaller, same, etc. Gradually the level of knowledge increased. The knowledge was transmitted orally and new knowledge was added to the existing assimilated knowledge. Based on the transmission it is considered as the first organized method of teaching. The growth of knowledge made it difficult to remember and pass it to future generations for handling the acquired knowledge effectively man started classifying the information based on similarity but the same was also found less effective as time progressed. Then man started scribbling on stones, dry leaves initially and then to printing material and then to textbooks. It was later supplemented by the use of teaching aids such as blackboard, pictures, charts, models, maps, etc. in this way the earlier concept of educational technology was limited to the use of simple audio-visual aids meant for direct teaching-learning.

Modern educational technology is not too aged. Even during the nineteenth century, Educational Technology existed in the form of toys and other learning tactics. However, it was frequently used from 1926. Because of the Industrial Revolution in America and Russia, other countries also started progressing in the field of educational technology. In this way, the beginning of educational technology took place in 1950 in America and Russia, and now it has reached England, Europe, and India.

The term "Educational Technology" was officially recognized in 1967 with the establishment of the National Council for Educational Technology in the United Kingdom. Educational Technology is now firmly established as a field of study including in its ambit.

The term Educational Technology is not confined to only one or two techniques but it is a wide network of various techniques in order to ensure, enhance and optimize the teaching and learning process and outcome effectively. It is a new field of education which is concerned with the modernization of educational inputs, process, and outputs with the involvement of science and technology along with the laws and principles of behavioral sciences. However, it also includes the formulation of learning objectives, appropriate teaching strategies and using the new scheme of evaluation. Its major purpose/aim is to facilitate and improve the qualitative learning of human.

Educational Technology is thus defined as “Educational Technology is the study and ethical practices of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources” (Association for Educational Communication and Technology, 1977).

Educational technology is a system in education in which machines, materials, media, men and methods are interrelated and work together for the fulfillment of specific educational objectives. The progress in the field of technology lead to ' Technology Explosion' that yielded several new machines, materials and media which have great potential for use in the educational system. A fair use of these technologies together functions and roles of educational

personnel can bring about more efficient and effective teaching-learning. An adequate knowledge of theory and practices of educational technology and their proper use would enable the teacher to understand and effectively discharge his new roles in the educational system in an age of 'information explosion', 'knowledge explosion' and 'population explosion' on the other hand the effective inclusion of such technologies in the educational system provides the learners with an environment of smooth and effortless learning.

The key phrase in 'Educational Technology' that is, 'Technology' is appropriate for achieving the specific learning objectives and for the better organization of the educational system into a work environment that is supervised thoroughly to ensure regular updating and to replace the system once an error is identified. Educational technology borrowed the 'systems approach' from management studies and 'corrective feedback' from cybernetics. The system approach in Educational technology considers education-having inputs, which are subjected to be a process designed to produce certain outputs that are intended to meet the stipulated objectives of the system. The application of this type of educational technology takes the system of education as a whole and views it in the context of the specified objectives and functioning of its interrelated parts and the whole system under the existing constraints. If the system meets the required objectives, it is maintained. If it does not fulfill the specified objectives, it is modified. As a result, various alternative Strategies and tactics are explored, designed and implemented and the most appropriate and feasible one is retained.

Educational technology as such is concerned with the development, application, evaluation of system, techniques and is to facilitate and improve the quality of human learning. It is concerned with achieving the goals of maintaining internal discipline and adapting to new environment etc. Educational technology is a combination of various media of mass communication, which are considered suitable for child's learning processes that can be adapted for solving many felt problems in an educational system. This has proved to be highly valuable in all aspects of education from reducing the workload to the smoothening of the teaching-learning process and in the accomplishment of educational goals. Nowadays, technology of education is being developed with the aim not only of making education more widely available, but also for improving the quality of education which is already available.

Educational technology helps teachers and learners by providing appropriately designed learning situations, which hold in view the objectives of teaching as well modified learning environment for learners through the varied techniques of presentation, arrangement of learning activities and organization of social and physical surroundings.

Educational technologies of the present times are developed with the aim not only of making education more widely available but also for improving the quality of education that is already available. Educational technology is conceptualized audio-visual aids it is also concerned with the Management and Organization of man and material.

The role of educational technology, in a traditional school setting, is to facilitate, through increased efficiency and effectiveness, the education of knowledge and skills. When technology is directly applied to an educational setting, such as a school, both the students and teachers can be viewed as learners. Technology can aid in educational achievement through two primary methods; the removal of physical barriers to learning and the transition of focus from the retention of knowledge to its utilization. Each of these methods must be examined in the context of their relation to both the student and the instructor in order to see their value and effect in educational settings.

In India, the concept of Educational, technology was often misunderstood just because the second component that is 'Technology' often changes. The basic tenet of Education technology is systematic the same technique of infusing Science and technology into the field of education has created wonders. This has proved to be highly valuable in all aspects of education from reducing the workload to the smooth thing of the teaching-learning process and in the accomplishment of educational goals.

Educational technology provides a promising future to our country. It is serving the cause of both formal and non-formal education along with the developmental tasks of the country. The efforts for the development were initialized by the Government of India itself. Mass media resources like radio and television have been widely and more effectively used for broadcasting educational programmers throughout the country. In the year, 1970 Government of India came out with a new initiative for educational technology. Under this, a

unit of educational technology was set up under the University of Education. In addition to this, educational technology cells were set up at the SITE states in the year 1974. With the launch of the Indian National Satellite for Educational purposes in the year 1980, the ministry of education carried out the production and transmission of educational programs via Doordarshan. INSAT conceived as a tripartite project and was supported by UNDP, UNESCO and the Government of India. For propagating educational development, Radios and Television sets were supplied to schools over many years.

The ministry of education formulated another scheme of Educational technology, which was entirely equipment driven between the years 1986 and 1990 and under this scheme a number of radio-cum-cassette players and Television sets were distributed. The invention of computers increased the scope of Educational technology. In the year, 1984 Government of India launched a computer literacy program as a joint venture of MHRD, Department of electronics and NCERT. This project worked with the help of computers offered by BBC. By the year, 2004 PC's were introduced in schools to keep up with the global trends.

Though Educational Technology is commonly used today experts point out that there are differences between the terms, "Technology of Education" and "Technology in Education". The term 'technology of education' is inherent in education itself. It refers to the application of principles of behavioural sciences like psychology to educational problems relating to teaching-learning. It is not concerned with the use of technological instruments in education. Broadly speaking, technologies of determining, educational objectives, planning

curriculum, instruction and teaching behaviour are covered under the concept of technology of education. In technology of education, principles mostly derived from psychology of learning find an important place.

The term 'technology in education' implies the use of implements, instruments, machines and tools in education in the same manner as we use for the development of any other aspect of our life.. Technology in education involves the use of a wide range of audio-visual equipments, hardware and sophisticated electronic devices like film projectors, radio, television, tape recorder, teaching machines, computers and internet, world wide web etc. Basically, technology in education involves the use of hardware technology in education. Both types of technologies have an important place in the teaching-learning.

Twenty first century witnessed the raise of a new terms that is "Technology integration" and "Instructional Technology" which are almost synonymous with "Technology in Education". The concept of technology integration has evolved recently from one of teaching programming, to utilizing drill and practice programmes to building computer literacy, and to participating in electronic communities. Technology integration is the incorporation of technology resources and technology based practices with the daily routines, work and management of schools. Technology resources are computers and specialized software, network based communication systems and other equipment and infrastructure. Practices include collaborative work and communication, Internet based research, remote access to instrumentation, and network based transmission and retrieval of data and other methods.

The invention of computer networks made a great shift in the field of educational technology. The spread of the internet leads to online-based educational technology through World Wide Web. The arrival of digital convergent media encouraged the interactivity and interconnectivity among educational technology. This added a new dimension to educational technology and gave an impetus to its further development as a discipline.

Digital education means digital learning. Digital education is an instructional method that effectively uses modern technology to enhance learners' learning experience. Digital learning occurs across all learning areas and domains. It encompasses many facets, tools, and applications to support and empower the teachers and students. Digital education provides splendid opportunities for all at once, that is in schools on one side and college on the other side that will enhance the enrollment ratio and benefits the students by making the learning process flexible and alternate by allowing them to study as per their convenience time and space. Digital learning mode helps the teachers and professors to suitably plan their lesson with digital technology. Digital learning makes the teaching-learning process smoother as it includes animations, justifications, and audiovisual effects. The pace of digital learning is increasing day by day. Through the advancement of digital technology, it changes method the students learn the concept and theory in schools and colleges.

The enhancement of digital learning the traditional method of teaching or rather chalk and talk method are gradually adapting to digital solutions. Digital

learning can ensure the participation of students as they are more familiarized with digital devices such as laptops, smart phones and I pads.

Digitalization of classrooms includes a curriculum of digital content management and infrastructure to support. Teachers in the classroom can capture every student and increase their attention using digital screens, thus facilitating each child to get the same base content and input from the teachers. This has increased student engagement as it combines various instructional strategies. Each student gets in contact with excellent education that is not easy to impart with the traditional chalk and blackboard teaching.

Digital education improves the quality of the teaching-learning process by sharing the available resources as audio, video, and multimedia sources. The continuous achievement in the field of information technology and the internet has multiple modes of digital education possible.

In the era of Globalization, up-gradation of education to novel approaches are important and digital education platforms are exploring the possibilities of blending Quick Response codes in the process of education.

Quick Response was first created in the year 1994 by Denso Wave incorporated, Japan. A QR code is the Abbreviation of Quick Response code, which is a machine-readable optical cable with information on the associated item or product. In barcodes, information is coded in one direction or one dimension only. On the other hand in a two-dimensional code, that is in Quick Response Codes the pieces of information are coded in two directions; horizontally and vertically. Information such as long multi-lingual text, a linked URL, automated

SMS message, business card or any information can be embedded into two-dimensional barcodes or as Quick Response Codes.

Quick Response Codes enable a fast, flexible, suitable, and user-friendly mode for students to access content and learn material online. At present Q.R. codes are used in the education sector only to access websites with course information and study materials. When considering quick response codes in an Educational context they are considered as an enabler or medium. The focus is more on pedagogy.

The Government of India, after analyzing this scope of QR Codes blended learning in the digital education world initiated a Nationalized knowledge sharing program under the ministry of human resource management. The program known as DIKSHA (Digital Infrastructure for Knowledge Sharing) aims at the sharing of resources via QR Codes within the textbooks. The program is a venture of MHRD along with the National Council of Educational Research and Training (NCERT) and State Council of Educational Research and Training (SCERT).

DIKSHA was developed based on the core principles of open architecture, open access, open licensing diversity, choice and autonomy as outlined in the Strategy and Approach Paper for the National Teacher Platform was released by the former Hon' Minister for Human Resources Development Shri Prakash Javdekar in May, 2017. DIKSHA itself was launched by the Hon' Vice President of India on Sept 5th, 2017 and has since been adopted by 35 states/UT's across as well as CBSE and NCERT and by crores of learners and teachers.

DIKSHA program offers teachers, students, and parents engaging learning materials relevant to the prescribed school curriculum. This initiative aims to ensure holistic learning for both teachers and students. This digital learning program is directed to access and create a comprehensive learning environment where both the tutor and student can learn together.

DIKSHA is a portal accessible in many languages for the convenience of the users. This program enables the teachers to create an interactive classroom environment and students can learn the content more effectively. DIKSHA program is designed by considering the class, location, and syllabus of the learners. Students and teachers can access this through the website and DIKSHA application. On DIKSHA program books are compiled or curated from school books or any book that conform to syllabi of the State or central board (CBSE) or any recognized institution or publication such as NCERT in the said medium of instruction language. Those textbooks with QR code are known as Phygital or energized textbooks. The QR code associated with the book or content enhances the discoverability of the content or the book. If there is one content for the scanned QR code the user gets the contents detailed page and if more than one content is associated with the same QR code, the user receives a list of results. The main advantage of DIKSHA learning program on the learning process is that students will be pre occupied with the contents and resources needed for learning. Following the footsteps of the Central Government the State Council for Educational Research and Training (SCERT) of Kerala has introduced the Energized Textbooks (ETBs) which are incorporated with the QR codes leading to the digital contents of the textbook. Making use of these feature, learners can

visually understand the concepts. Through scanning the available QR code the learners directly enters into the digital content of the subject or chapter they are studying. The application enables the teachers and students to accept a new method of learning that is, Blended Learning. Thus through using these energized textbooks in the learning process the learners can blend the resources from the traditional classroom and digital classroom to make the learning much more effective.

NEED AND SIGNIFICANCE OF THE STUDY

The primary source of teaching learning process is textbooks and supplementary reading materials apart from reference books. By and large teachers as well as the learners has to rely over upon textbooks and depending on their interest and availability of material they try to acquire more information through supplementary materials and reference materials. This is applicable even to teachers due to non availability of resources. With standing the above, one would agree that our system is essentially based on teaching learning through text books and is bound to remain same in the future too.

The system of learning or teaching just using textbook has several limitations like financial constrain from the perspective of pupil to access the supplementary materials. Thus in the existing teaching learning process the basic tool is the textbook in which the contents are structured in a linear manner. But the content would be limited.

A teaching process that purely consists of verbal transaction is seldom effective in holding attention, stimulating interest or encouraging students to

analyze, evaluate and think critically and learning may become monotonous for them. So in this world science and technology it is not possible for to one single technique or medium

The 21st century brought up many inventions in the field of science and technology that enhances every aspects of human life. The advancement in the field of science and technology opened up various opportunities in the field of education and increased the quality and accessibility of education.

Ever since science and technology was collaborated with education in the form of audio-visual aids it has proved as a good helper and companion for teachers and is a perfect guide for students to enhance the effectiveness of their learning.

A simple and traditional meaning of education is to gain the ability to communicate effectively through reading or writing. The definition however, refers to textual or alphabetic literacy. But today rather than gaining mere textual or alphabetic literacy the learners as well as teachers of the current days needs updated knowledge about the technological integration in the field of education. Thus, in this modern, scientifically progressed and technologically developed period, education necessarily requires validity and novelty in the teaching strategies and methods for the effective transaction of different subjects. The emergence of digital technologies has helped to achieve a better status in the effective transaction of contents.

Digital is a word with many meanings and assumptions. The literal meaning of the word refers to the technology or encoding information in ones and

zeros. “We live in the digital age, an era distinct because of ubiquitous networking and prolific use of technology in almost all aspects of human life.” (Wang,2013)

Digital revolution seems to highly necessary in developing countries like India where students are abundant and teachers are relatively scarce. Digital technologies have the potential to individualize the teaching experience and extend the reach of educational activities outside the boundaries of educational institutions. With the progression of digital technology in education, there has been a paradigm shift in education throughout the world. It is proceeding from teacher-centered learning to modern methods of learner-centered teaching

In Kerala, the general thinking of learners are it is difficult to master in English language. To remove the fear for English in learners the digitalization of chapters which includes, animations, pictures and audios would be of great help. With the help of digitalized teaching learning materials the teaching learning process of English can be done more effectively as the digital contents provides facilities such as listening and visualizing than mere comprehending by reading text books.

Teaching and learning of a language is not a simple task, especially when it comes to English which is often regarded as a second language. The effectiveness of teaching learning process of English really matters since English is considered as an International link language. Naturally second language learning requires an internal motivation and to build up knowledge richness in any language the concrete knowledge about the language is necessary. So, teaching learning process of English requires perfect efforts and definite goals to achieve

the desired success. This is where digital contents learning gains importance as it considers the diversity of learners' abilities as well as creates wider opportunities for society to obtain education.

The QR codes in education can be placed in the context of mobile learning. These technologies have great potential to improve teaching and learning because mobile technologies enable learning across multiple contexts through social and content interactions. In other words, learners can anytime and anywhere and learning can be personalized and authentic. Aiming for these advantages lead to the establishment of the DIKSHA program because QR Codes are versatile. In other words, QR Codes can expand the learning experience and provide an authentic task that takes place in real-world settings. The Quick response codes in the textbooks provide the learners with new experience of attending a classroom from home itself.

The QR Codes inculcated in Kerala English Reader provides a new vision for teaching learning process of English language. This makes the learners understand the concepts faster, develops interest or increases their participation and boosts their achievement. This can also be useful to learners with special needs as it includes multi sensorial approach. This can also help the learners to revise their work and construct knowledge.

Digitalized contents can also support the concept development of learners in a variety of ways to meet individual differences. This also offers the learners to take their learning into new level by blending it.

The COVID 19 pandemic has led to disruptions in normal life including the closure of schools. This has affected millions of children. To mitigate the impact of pandemic a remodeling of teaching- learning process happened so far by a healthy mix of schooling at home and school and has increased the popularity of this program among teachers and learners. With extended schooling solution DIKSHA makes it possible to the learners to learn by taking structured courses at their own pace or as per a schedule published by relevant authorities or mentors. Contents here include explanation videos, practice content, assessments, and material for extended learning. The incorporation of QR Codes as a part of the program provides them with a flexible option to study as per their time and pace. The audio and video included in this program boosts their cognitive elements in child's brain and makes teaching a smoother experience with a perfect of personalized packages having a blend of animations, gamification, and elaborate audiovisual effects. Diksha program allows the learners to create a hybrid constructivist classroom for this; awareness about such programs is inevitable and such a study on the effectiveness of the program would be more useful in the development of digital classrooms.

STATEMENT OF THE PROBLEM

The study is stated as “**An Evaluation of the Effectiveness of Digital Infrastructure for Knowledge Sharing (DIKSHA) Programme in the English Reader of Standard IX at Kerala.**”

DEFINITION OF KEY TERMS

Evaluation

A common definition for the term Evaluation will be that, it is “The process of determining to what extent the educational objectives are actually being realized” (Tyler, 1950). In this study “An Evaluation on the effectiveness of DIKSHA program in the English reader at Standard IX of Kerala,” the overall effectiveness and a cross check of the quality of digital content included in the program for English learning is being analyzed.

Effectiveness

Effectiveness means the degree to which something is successful in producing desired result (Oxford Dictionary). In this study; “An evaluation on the effectiveness of DIKSHA program in the English readers at Standard IX of Kerala. The effectiveness of the program with respect to its mission and vision is going to be studied by analyzing the English Reader of STD IX of State Syllabus.

DIKSHA Program

DIKSHA means Digital Infrastructure for knowledge, which is a National platform for school Education and initiative of Government of India. This program is a venture of MHRD (Ministry of Human Resource Development) along with both the Central and State Governments and with NCERT (National Council for Educational Research and Training) and respective SCERT (State Council for Educational Research and Training). The DIKSHA platform offers teachers, students, and parents engaging learning material relevant to the

prescribed school curriculum. In collaborating with the Central Government the SCERT of Kerala has introduced Energized Text Books (ETB's) which is incorporated with QR codes so that the learners can visually comprehend the concepts visually.

English Reader of Standard IX

Kerala English reader of class IX is analyzed here in this proposed study in order to understand the effectiveness of this program. The textbook is of two parts consisting of units in total. Each unit includes two prose and two poetry altogether.

VARIABLE OF THE STUDY

'An Evaluation on the effectiveness of DIKSHA program' is the variable in the proposed study.

OBJECTIVES OF THE STUDY

The major objectives of the proposed study are;

- ◆ To find out the effectiveness of DIKSHA program in the learning of English.
- ◆ To review the quality of digital contents in DIKSHA program.
- ◆ To find out the opinion of Teachers about the effectiveness of DIKSHA program
- ◆ To find out the opinion of Students about the effectiveness of DIKSHA program.
- ◆ To find out whether there exist any significant difference in the effectiveness of DIKSHA program between the subsamples of the

- i. Government School Teachers
 - ii. Aided School Teachers.
- ◆ To find out whether there exist any significant difference in the effectiveness of DIKSHA program between the sub samples of the
- i. Government School Students
 - ii. Aided School Students

METHODOLOGY

It is the description of the procedure of techniques adopted in research study or investigation. The decision about the method depends on the nature of the problems selected and kind of data required for its solution.

Method

The study is a mixed research including both the Qualitative and Quantitative aspects of DIKSHA program. In the qualitative aspect the investigator will review the quality of digital contents included in the program for the English reader of Kerala Syllabus for Standard IX. The study adopts survey method in order to understand the opinion of teachers and students on the effectiveness of DIKSHA program in the STD IX English reader of State syllabus.

Sample

The population for the study comprises of teachers and students of Secondary level. The sample will consist of 300 students from the class IX of State board from all over Kerala and 100 teachers of English teaching at class IX in the Government or Government aided schools all over Kerala.

Tools for Data Collection

To measure the variable Effectiveness of DIKSHA program an Opinionnaire developed by the investigator in collaboration with the supervising teacher will be administered.

Data Collection Procedure

Data will be collected from English teachers at secondary level (STD IX) and from students of class IX from Government and Government aided schools all over Kerala. For the purpose of collecting data an Opinionnaire will be administered among selected sample.

Statistical Techniques

The following statistical technique was administered for the analysis of Data;

- i. Percentage Analysis

SCOPE AND LIMITATIONS OF THE STUDY

The study has been intended to identify the Effectiveness of Digital Infrastructure for Knowledge Sharing (DIKSHA) Programme in the English Reader of Standard IX using Opinionnaire. The study was conducted on 320 students and 100 teachers from various schools of Kozhikkode, Wayanad, Malappuram, Kannur and Thrissur and Kasargode districts. Even though proper precautions was undertaken to make study as accurate as possible certain limitations have crept into the study. The following are some limitations which the

investigator came across due to the shortage of time, geographical reasons and other practical differences.

1. The research was limited to the Northern Districts of Kerala
2. The research was limited to the Kerala state syllabus
3. The research was conducted only based on IX grade English textbooks.
4. The research was conducted only on English Teachers teaching at Standard IX
5. The research was conducted on students studying at standard IX
6. The research was conducted only on teachers teaching at Government schools and Government aided schools
7. The research was conducted only on students studying at Government schools and Government aided schools.
8. Face to Face interactions with the learners and teachers while collecting the data was not possible due to the existing COVID 19 pandemic situations.

ORGANIZATION OF THE REPORT

The report of the study is presented in five chapters. The details incorporated in each chapter are as follows.

Chapter I: Presents a brief introduction of the study, need and significance of the study, statement of the problem, definition of key terms, variables for the study, and objectives of the study. Methodology, scope and limitations of the study and organization of the report.

Chapter II: Presents the review of related literature which includes theoretical over view and review of related studies

Chapter III: Presents the methodology of the study, details of variables, tools used. Selection of sample procedure for data collection, scoring techniques used for analysis and statistical technique used.

Chapter IV: Brings out the details of statistical analysis of the data and discussion of the result.

Chapter V: Deals with summary of the study, major findings, educational implications of the study and suggestions for further research in this area.

CHAPTER II

REVIEW OF RELATED LITERATURE

◆ Theoretical Overview

◆ Review of Related Studies

CHAPTER II

REVIEW OF RELATED LITERATURE

Review of related literature is an important aspect of investigation. Review of related literature enable the researcher to define the limits of his field, brings the research up to date, avoids unfruitful and rejects outdated problems, helps to avoid unintentional duplications, gives the researcher an understanding about research methodology, tool and instruments used and an insight into statistical techniques adopted and also to know more about the recommendations in previous researches.

According to Mouley (1970), the survey of related literature is a general aspect in the planning of the study and the time spent in such a survey, invariably is a wise investment. It provides of gaining an insight to methods, measures, subjects and approaches employed by other research workers, which in term will lead to significant improvement in this own research design. A brief summary of previous research and the writing of the recognized expert provide evidence that the research is familiar with what is known already. moreover, with what is still unknown and un tested. Thus, the survey of related literature facilitates the research worker to eliminate the risk of duplication and provide them with useful hypothesis and worthwhile suggestion for significant investigation.

In order to get an insight into the theoretical background of the study, related studies were thoroughly reviewed. The result of the review is summarized in this chapter. For convenience, this has been attempted in two sections.

◆ Theoretical overview

- ◆ Review of related literature.

THEORETICAL OVERVIEW

Theoretical overview provides a theoretical background of the study. Brog and Gell (1974) say, the more powerful a theory the more events can be explained by it. Theoretical research usually consists of testing a hypothesis that is derived from a theory. The theory provides a rational explanation of the results; it gives clarity and vividness to the study.

Digital Infrastructure for Knowledge Sharing (DIKSHA) Programme aims to provide digital contents through the form of Quick Response Codes that are included in the Textbooks of each subject. Digital contents thus opens up possibilities for spreading awareness about the relevance of Techno Pedagogical Content Knowledge (T – PACK), and the establishment Flipped Learning and Blended Learning in Teaching learning process.

Technological Pedagogical Content Knowledge (T – PACK)

Punya Mishra and Matthew J. Koehler’s 2006 TPACK framework, focuses on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK), offers a productive approach to many of the dilemmas that teachers face in implementing educational technology (edtech) in their classrooms. The TPACK framework outlines how content and pedagogy must form the foundation for any effective edtech integration. This order is important because the technology being implemented must communicate the content and support the pedagogy in order to enhance students’ learning experience.

According to the TPACK framework, specific technological tools like hardware, software, applications, associated information literacy practices, etc are best used to instruct and guide students toward a better, more robust understanding of the subject matter. The three types of knowledge – TK, PK, and CK – are thus combined and recombined in various ways within the TPACK framework.

Content Knowledge (CK) – This describes teachers’ own knowledge of the subject matter. It includes knowledge of concepts, theories, evidence, and organizational frameworks within a particular subject matter and may also include the field’s best practices and established approaches to communicating this information to students. CK will also differ according to discipline and grade level

Pedagogical Knowledge (PK) – This describes teachers’ knowledge of the practices, processes, and methods regarding teaching and learning. As a generic form of knowledge, Pedagogic Knowledge encompasses the purposes, values, and aims of education, and may apply to more specific areas including the understanding of student learning styles, classroom management skills, lesson planning, and assessments.

Technological Knowledge (TK) – This describes teachers’ knowledge of, and ability to use, various technologies such as technological tools, and associated resources. Technological Knowledge concerns more about the proper understanding edtech, considering its possibilities for a specific subject area or classroom, learning to recognize when it will assist or impede learning, and continually learning and adapting to new technology offerings.

Pedagogical Content Knowledge (PCK) – This describes teachers’ knowledge regarding foundational areas of teaching and learning, including curricula development, student assessment, and reporting results. PCK focuses on promoting learning and on tracing the links among pedagogy and its supportive practices such as curriculum, assessment, etc, and much like Content Knowledge, will also differ according to grade level and subject matter. In all cases, though, PCK seeks to improve teaching practices by creating stronger connections between the content and the pedagogy used to communicate it.

Technological Content Knowledge (TCK) – This describes teachers’ understanding of how technology and content can both influence and push against each other. TCK involves understanding how the subject matter can be communicated via different edtech offerings, and considering which specific edtech tools might be best suited for specific subject matters or classrooms.

Technological Pedagogical Knowledge (TPK) – This describes teachers’ understanding of how particular technologies can change both the teaching and learning experiences by introducing new pedagogical affordances and constraints. Another aspect of TPK concerns understanding how such tools can be deployed alongside pedagogy in ways that are appropriate to the discipline and the development of the lesson at hand.

Key ideas of T-PACK

- ◆ Concepts from the content being taught can be represented using technology.
- ◆ Pedagogical techniques can communicate content in different ways using technology.

- ◆ Different content concepts require different skill levels from students, and edtech can help address some of these requirements.
- ◆ Students come into the classroom with different backgrounds – including prior educational experience and exposure to technology – and lessons utilizing edtech should account for this possibility.
- ◆ Educational technology can be used in tandem with students' existing knowledge, helping them either strengthen prior epistemologies or develop new ones.

Flipped Learning

Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. The flipped learning approach is an alternative instructional approach where the direct instruction during class time and homework are reversed. The instructional materials which contain content of one particular unit are introduced and viewed by the learners at home before the class time. Meanwhile homework such as exercises, projects or class discussions are done during class time.

Educationalists' discuss four pillars of Flipped learning

Four Pillars of Flipped Learning:

- ◆ Flexible learning environment
- ◆ Learning culture
- ◆ Intentional content
- ◆ Professional Educators

Characteristics of Flipped Learning

- ◆ Provide an opportunity for students to gain first exposure prior to class.
- ◆ Provide an incentive for students to prepare for class
- ◆ Provide a mechanism to assess student understanding
- ◆ Provide in- class activities that focus on higher level cognitive activities.

Advantages of Flipped Learning

- ◆ Students take ownership for learning
- ◆ It emphasizes co-operative learning
- ◆ It is more efficient
- ◆ It provides more time to explore content

Blended Learning

Blended learning, also referred to as hybrid learning, combines the best features of traditional schooling with the advantages of online learning to deliver personalized, differentiated instruction across a group of learners. Blended learning incorporates direct instruction, indirect instruction, collaborative teaching, individualized computer assisted learning

Characteristics of Blended Learning

- ◆ Students have the option of the two modes
- ◆ Teachers are well versed with both the modes
- ◆ Students get face to face interaction as well they interact in virtual space
- ◆ It provides multicultural and multi dimension approach to teaching learning process
- ◆ Student constructs knowledge rather than just consuming it
- ◆ Students get wide exposure and new perspectives of the course content
- ◆ Physical development is possible with in school campus
- ◆ It has a human touch
- ◆ Students get full experience in using new technology.

Advantages of Blended Learning

- ◆ As part of learning is done through ICT, online or offline mode so teachers and students get more time in the classroom for creative and cooperative exercise
- ◆ Opportunity for collaboration at a distance: Individual students work together virtually in an intellectual endeavour as a learning practice.
- ◆ Increased flexibility: Technology-enabled learning allows for learning anytime and anywhere, letting students learn without the barriers of time and location but with the possible support of in-person engagement.

- ◆ Increased interaction: Blended learning offers a platform to facilitate greater interactivity between students, as well as between students and teachers.
- ◆ Enhanced learning: Additional types of learning activities improve engagement and can help students achieve higher and more meaningful levels of learning.
- ◆ Learning to be virtual citizens: Learners practice the ability to project themselves socially and academically in an online community of inquiry. Digital learning skills are becoming essential to be a lifelong learner, and blended courses help learners master the skills for using a variety of technologies.

REVIEW OF RELATED LITERATURE

Sanal Yashobanta (2000) “Effectiveness of the School Broadcasting Programs of All India Radio (AIR) and Educational Television Programs of Dooradarsan with reference to school achievement of Students”. The study aimed to analyze the effectiveness of educational programs broadcasted through Radio and Television programs. The study followed experimental research pattern. A sample of 60 students and 10 teachers were selected for the study. The collection of data required was done using achievement test, attitude scales, and reaction scales prepared and standardized by the investigator. The data was analyzed using ANOVA and it was significant that there exists a difference in the pre test and posttest scores. The analysis of results proves that Educational programs make it

clear that Educational programs telecasted through Doordarshan and All India Radio has a positive impact on the school achievement of pupils.

S. Shihabudheen (2001) “A study of the Effectiveness of Programmed instruction in learning English as a second Language by secondary school pupils.” The study aimed to analyze the effectiveness of comparative programmed instruction and conventional method of teaching on achievement in English of secondary school pupils. The study followed an experimental research pattern. The study was conducted in a sample of 184 students. The required data for the study was collected using tools such as achievement tests, rating scales and intelligence test developed and standardized by the investigator. The collected data was analyzed using the inferential statistical techniques such as ANOVA and ANCOVA. The collected data was analyzed with the help of ‘Statistica’ software. After analyzing the data it was visible that there exists a difference in the pre test and post tests scores of the data, the posttest scores significantly shows that the programmed instruction is more effective than the conventional method of teaching. Teaching and learning material was found beneficial to the student irrespective of their achievement.

Maharajan, Shiva Sharan (2001), “Effectiveness of Health Education Program in the Secondary Schools of a Nepal proposed Model.” The main objective of this study is to assess the existing condition of health instruction, health services and healthful living and their management in the schools of Kathmandu valley of Nepal. The study followed descriptive survey method and the population of the study included Parents, Students, health teachers, and

Headmasters. From the population the samples were choosing purposive, stratified, random, and incidental sampling techniques. A sample of 555 students, 74 parents, 52 health teachers and 52 parents were chosen as the sample for the study. Questionnaires and observation schedule developed the investigator was used to collect the data required for the study. T- Test was used to analyze the data. The result of the study was that parents, teachers' students, and headmasters gave priority to health education in schools. The respondents from the Government schools gave more preference to health education than those of the private school respondents.

Jayaraman (2006) studied the "Effectiveness of computer based multimedia learning packages on performance and behavioral outcomes of students." The study was conducted with the major objective of identifying how CBMMLP aids in facilitating learning. The study followed experimental research design and was conducted in a sample size of 196 students from various age groups which were divided into experimental and control groups consisting of 104 and 96 students respectively. The data required was collected by conducting pre test and post tests. The collected data was analyzed using percentage analysis. The results revealed that that higher age group of learners had been found satisfied more in the interaction with CBMMLP and it was also found lower aged students could not express either their satisfaction or dissatisfaction because of lack of prior experience with computer.

Inamdar Radhika Namadra (2007) "To study the Effectiveness of computer assisted instruction program for teaching geography to std VIII

students.” the investigator analyzed the effect of computer-assisted interaction over the limitation of traditional method of teaching Geography. The research follows qualitative research method. The population of the study was Marathi medium as well as aided secondary schools from Pune Municipal Corporation. A sample of 280 students was chosen for the study using the purposive sampling technique from the population. Questionnaires, Opinionnaires, and graphical representation were the tools used for the analysis of the data. The data was analyzed using ANOVA and percentage analysis. Through conducting the research, the investigator reached in the conclusion that Geography teaching would be more effective with the assistance of computer rather than the traditional format of textbook oriented teaching.

Sevak, Soual. N (2008) conducted a study on the “Effectiveness of Computer based power point programs.” The major objective of the study was to identify the effectiveness of Computer based power point programs in the teaching and learning of English language. The investigator in the study followed Experimental research design with a sample of 1200 students selected through purposive sampling technique. The required data for the study was collected using the self-constructed tools by the investigator. Self-constructed computer based PowerPoint program along with achievement test were the tools used. The collected data was analyzed inferential statistical techniques such as ANIVA and T- Test. the final finding of the study was that there exists a significant difference between the pre test and post test scores of the learners making it clear that computer based power point programs had a great effect in the enhancement of teaching learning process of English language.

Patel Atulkumar Baldevbhai (2009) “A study of the Effectiveness of the laboratory teaching program on the achievement of the students of Standard VIII of Mathematics” The study followed an experimental research pattern and was carried out in a sample of 220 students from Ahmadabad. The data required for the study was collected using tools such as a tool on laboratory teaching program and a set of achievement test developed by the investigator. The investigator adopted intelligence quotient test developed by Dr K.G.Desai and SES Test by Dr. H.N Tapodhan for the purpose of data collection. The collected data was analyzes using ANOVA. After the analysis of the data, it was that laboratory-teaching program had a significant effect on the achievement in Mathematics.

Sharma, Shashi Kant (2011) “Effectiveness of Inclusive Education Program in Himachal Pradesh- an Evaluate study”. The study was conducted with the major objective of analyzing the structure and organization of inclusive education program in Himachal Pradesh. To the fulfillment of the objectives, descriptive research method was fixed. The sample for the study was chosen from four different population including 25 administrators, 200 teachers, 100 students and 150 parents. For collecting the data, tools were prepared by the investigator. Interview schedules were prepared for administrators, parents, and students. A self-concept scale was constructed and standardized were used to know the self-concept of children with special needs. Through the study, it was understood that there are differences in the attitude of teachers, parents students and administers in the effectiveness of Inclusive education.

Vida Minakshiben (2013) “Effectiveness of Mastery Learning Program in teaching of Accountancy at Class XI.” The research mainly aimed to enable the students grasp the whole contents taught by the teacher and to find out the effect of mastery learning on the various variables like Gender, Intelligence, Attitude, and Retention. For conducting the survey, 104 students were selected and it followed an experimental research design. Opinionnaires, Intelligence Quotient test and Attitude scale prepared and standardized by the investigator was used for the purpose of data collection. After analyzing the data it was found that the pre test scores and post test scores shows a significant difference which proves that that mastery learning program is effective for higher secondary students for the subject of Accountancy. The program had a positive effect on Intelligence and attitude of students.

Paramar Pavinchandra D (2013) “A study of the Effectiveness of Computerized program Learning on the achievement of the Students of grade VIII in Social Science.” the research mainly aims to study the effectiveness computerized linear program self-learning material and traditional method on the achievement of students in Social science subject. The research followed experimental research pattern on a sample of 138 students of Grade VIII. The data was collected using the opinionnaire and achievement test constructed and standardized by the investigator. The collected data was analyzed using ANOVA. After analyzing the data it was identified the pre test score has, a great significant once compared to the posttest scores, which proves that traditional method has higher level of achievement than computerized learning material.

Pandya Surabhi M (2013) Effectiveness of CAL program as a Self-learning technique”. The study aimed at understanding the effectiveness of computer assisted programmed learning material and traditional teaching material in terms of achievement scores obtained by the students on teacher made achievement. The research followed experimental research design with a sample of 96 students. Achievement test developed and standardized by the investigator was used as the tool for data collection. Thus after analyzing the collected data it was understood that computer assisted learning and programmed learning material were found equally effective in raising student achievement in direct – indirect unit of English grammar. Computer assisted learning package was found more effective than traditional teaching in raising students achievement of English grammar. The programmed learning material was found more effective than traditional teaching in raising students’ achievement of English Grammar.

Tanuboli Dattatreya (2014), “Effectiveness of a Communicative approach based program in spoken English for Urdu medium students of Grade VIII.” The research aimed to study the effectiveness of a communicative approach developed for Urdu Medium students of grade VIII. The research followed mixed research design. For the qualitative aspects, survey method was adopted and on the quantitative side, experimental research design was adopted. The sample for the study was selected from the population English teachers in the Urdu medium schools and students from Urdu Medium Schools. From this population a sample of 360 students, 25 teachers, and 100 parents were selected. The data was collected using questionnaire and a pre test program for survey and experiment for posttest respectively. The collected data was analyzed using the percentage analysis and T

test for significance testing. The results proved that there was a significant improvement in the spoken English of Urdu Medium students of Standard VIII after the implementation of the program using communicative approach.

Chaudary, Poonam (2014) “Effectiveness of Intel teach program on attitude towards ICT Digital literacy and Study process of teacher educators.” The study was conducted over a sample of 200 teacher educators. For the collection data from the samples, the investigator developed and standardized the tools such as attitude scales, digital literacy scales, and study process scales. The collected data was analyzed using ANOVA and after the analysis of the collected, it was found that there is significant difference in the study process using ICT.

Thanka Leela, P (2014) conducted a study on “Effectiveness of computer based instruction acquisition of English vocabulary of secondary students.” the study was conducted with the major objective of identifying the effectiveness of computer based instruction on acquisition of vocabulary and developing a package for vocabulary instruction. The study follows an experimental research design was carried out in a sample of 72 students. The sample was divided into control groups and two experimental groups having 24 members each in every group. The required data was collected using test of non- verbal intelligence and Lewi’s vocabulary test in English. The collected data was analyzed using descriptive statistical techniques such as mean, percentage, standard deviation and Pearson’s coefficient correlation and was identified that the there is a significant difference in the acquisition level of learners. this implies that computer based instruction helped students in acquiring English vocabulary.

Meenakshy Ramachandran S studied the “Effectiveness of Computer assisted approach for developing spelling skills of upper primary students.” The study was carried out in a sample of 300 students from upper primary classes of Government schools. The required data was collected using tools such as Kottmeyer’s spelling test and Computer Assisted Package developed the investigator. The results of the analysis shows that computer assisted instruction will be effective in improving the speaking skills of backward learners and spellers of upper primary classes.

Suresh John Kennedy A (2015) studied the “Effectiveness of computer based instruction in teaching Chemistry for higher secondary students”. The study was conducted with a major objective of identifying the effectiveness of computer assisted instruction in the achievement of chemistry. The study follows an experimental research design with a sample size of 150 senior secondary students equally divided into experimental and control groups with 50 students each. Data required for the study was collected using criterion referenced test, aptitude tests and attitude tests. The collected data was analyzed using T- test and it was found out that there existed a significant difference in the pre test and post test scores of the learners that proves the effectiveness of computer assisted teaching of Chemistry.

Chandra boss Samson H (2015) “Effectiveness of programmed learning material in the achievement of disabled students in Mathematics at Standard IX in Tamilnadu.” The investigator aimed to find out the effectiveness of Programmed learning material as compared to the conventional method of teaching for disabled

students studying in standard IX in terms of their achievement on the criterion test. The study followed experimental research design. The sample chosen for the study are 360 disabled students of Standard IX by the stratified sampling technique. The sample was divided into 180 students each making the controlled and experimental group respectively and a pre test and posttest was conducted . The data was collected using an achievement test constructed and standardized by the investigator. The collected data was analyzed using T test. The final results of the data proves that there is a significant difference in the pre test scores and post test scores that leads to a conclusion that learning through programmed learning material helped in enhancing the gain in achievement scores of disabled students than the disabled students learnt through conventional methods in Mathematics.

Chauhan Bhavin(2016) Effectiveness of a Classroom communication program for pre- service teachers. The investigator aimed at developing, implementing and evaluating the effectiveness of classroom communicating program for B.Ed trainees. The study followed experimental research pattern. B.Ed trainees from Gujarat were chosen as the population for the study. By adopting purposive sampling technique a sample of 200 students were chosen from various teacher-training colleges. The data required for the study was collected using Opinionnaires. After analyzing the data, it was significantly visible that the classroom communication program had a great effect on pre service teachers.

Kousalya, L (2017) “Effectiveness of different web based instructional strategies in learning structural words in English.” The study was conducted based

on the major objective of developing, evaluating and finding out the effectiveness in realizing instructional objectives in learning structural words in English. The study followed experimental research design. The study was carried out in a sample of 112 learners. The target population was invited through various web platforms. The data was collected using a web based E- learning software package and an evaluation Performa designed with five point scale. The collected data was analyzed using the T – TESTS and ANOVA. From analyzing the collected data the results shows a significant increase between the scores of pre- test and posttest score of the samples. This analysis shows that the structural words learning will be more effective with the use of web based instructional strategies.

Balasubramanyan N (2018), “Effectiveness of Web based instruction in cognitive learning of Mathematics parabola.” The main objective of the study is to test the effectiveness of we based learning in Mathematics. The study followed experimental research design with a sample of 171 students of grade XI from the schools of Coimbatore district. The data required for the study was collected using a set of five tools developed by the investigator which includes a web learning package, online testing software, criterion test and an evaluation Performa designed with five point scale to validate the web base instructional material. The collected data was analyzed using paired T- Tests. The analysis of the results shows an increase in the posttest scores when compared to the pre tests. This shows that web based instruction would be well integrated into the conventional classroom in order to enhance achievement of students.

Boro Devita (2019), “Effectiveness of use of Online and offline learning resources on the study habits and performance of undergraduate students in Assam.” The study follows an experimental research pattern with the major objective of studying the use of offline and online learning resources and its effectiveness on study habits of the learners in relation to the disciplines of science, Humanities and Commerce. The population of the study was fourth semester undergraduate students who were continuing their studies in the colleges of Assam in the session 2016- 2017. From this population a sample of 240 students were selected through the techniques of cluster, random and multistage sampling. The data required for the study was collected by using the tools like scales, questionnaires and various tests. The data was analyzed using T -Test and the results of pre test and posttest had significant difference. The results of posttests showed that that the undergraduate students are most equipped with offline learning resources than online learning resources. The difference might have occurred because due to less awareness or negligence of the newly introduced digital resources or might be because of the long habitual practices of studying from the textbooks.

Gururumayum, Bidyarami (2019)” Effectiveness of E- Learning for ESL learners at class VIII level.” The study followed experimental research design. The main purpose of the study was to develop an E- learning program and to study its effectiveness on the students studying in class VIII in Gujarat medium of Gujarat state. The population of the study was the students from class VIII of Gujarat. From this population the investigator selected students from two schools for the experimental and controlled group through convenient sampling technique.

In total 76 students from the two schools were selected as the sample for the study. Achievement test developed and standardized by the investigator was used for the collection of the required data. The researcher collected the data in terms of numbers and analyzed it using the measures of descriptive statistics like mean, percentage, standard deviation and the measures of inferential statistics such as T-Test. For the analysis of qualitative data obtained through feedback from the investigator adopted frequency count technique and after that the frequencies were converted into percentage. After the analysis of the collected data, there existed a significant difference in the scores of pre test and posttest scores. It proved that that E- learning had a positive influence on English language learning of ESL learners and this E- Learning program has enhanced the ICT skills and helped them to improve their overall English Language skills.

Pandya, Archana. G (2019), Effectiveness of teaching through Animation on Achievement of students in English subject of Standard VI. The study mainly aims to develop and identify the effectiveness of animation sequences of the select units of the English textbooks of Standard VI. The research follows experimental research design. The population of the research is the students of Sixth standard of Gujarati medium primary schools of Navsari district, Gujarat. The researcher randomly selected two Gujarati medium primary schools out of 821 such primary schools in Navsari District. From this a sample of 205 students were selected. The pre test and post- test were conducted to analyze the effectiveness of animated contents of the units selected. Teacher made Achievement test prepared and standardized by the investigator was used as the tool for post- test. The prepared test was of 50 marks. To analyze the collected data statistical techniques mean

scores, standard deviation and T- test were adopted. For the data analysis, the investigator used the SPSS software. The practical significance of the experiment was measured through formula of effect size. From the analysis of the data, it is significant that teaching with the help of animation is more effective in terms of achievement in English subject compared the traditional way of teaching and it enhances the achievement of the learners of English subject of standard six of the Gujarati medium schools of Navsari district.

Ramalakshmi. P (2019) studied the 'Effectiveness of Second Generation web tools in enhancing secondary level teacher Education'. The study aimed at developing a software and web quest and to analyze the effectiveness of web 2.0 tool in enhancing the secondary level teacher education. The study followed an experimental design with a sample of 72 secondary level teacher trainees identified through using the random sampling technique. The required data was collected using an awareness test and an achievement test prepared by the investigator. The collected data was analyzed using both the descriptive and inferential statistical techniques. The investigator after analyzing the data, found that there exists a significant difference between pre test and posttest scores of the students secondary level teacher students and was understood that web tools had a great influence in enhancing their learning.

CHAPTER III

METHODOLOGY

-
- ◆ Variable of the study
 - ◆ Objectives of the study
 - ◆ Methods used.
 - ◆ Sample selected for the study
 - ◆ Tools employed for data collection.
 - ◆ Data collection procedure
 - ◆ Scoring and consolidation of data.
 - ◆ Statistical techniques used.
-

CHAPTER III

METHODOLOGY

Research methodology is considered as a systematic way to solve a felt problem. It is a science studying how a research has to be carried out. Thus research methodology can be defined as, ‘the procedures by which researchers go about their work of describing, explaining and predicting phenomena’. It can be described as a path framed by the researcher for a smooth conduct of the study that will provide a clear idea about how the researcher formulates a problem, set their objectives and present their results from the collected data over the period of study. This will also show how well the outcome would be obtained at the end of the study by meeting its objectives. Therefore, the major purpose of research methodology is to satisfy the research plan and target devised by the researcher. The quality of a study depends upon the selection of suitable methods and tools for investigation. A pre- planned and well-designed methodology will provide the researcher a scientific and flexible plan for solving the problem under analysis. It will help the investigator to explore different trends in the field and adequately measure them to satisfy the requirement of the investigation.

The purpose of this investigation is to study the effectiveness of Digital Infrastructure for Knowledge Sharing (DIKSHA) program in the Kerala English reader prescribed for grade IX.

In this chapter; the research methodology that was chosen for conducting this research is discussed and the reason for choosing the particular research method is explained. The chapter also aims to discuss the various methods

employed in research in a general way with its focus on the various types of methods employed in educational research.

This methodology of study includes an over view about the research design adopted, types of data collected, the sampling design, and the interpretation towards the conducting of respective research and the statistical tool selected for the proposed research.

The methodology adopted for the study is described under the following headings:

- ◆ Variable of the study
- ◆ Objectives of the study
- ◆ Methods used.
- ◆ Sample selected for the study
- ◆ Tools employed for data collection.
- ◆ Data collection procedure
- ◆ Scoring and consolidation of data.
- ◆ Statistical techniques used.

VARIABLE OF THE STUDY

The variable of the study is “Effectiveness of Digital Infrastructure for Knowledge Sharing (DIKSHA) program in the English reader at Standard IX of Kerala.”

OBJECTIVES OF THE STUDY

- ◆ To find out the effectiveness of DIKSHA program in the learning of English.
- ◆ To review the quality of digital contents in DIKSHA program.
- ◆ To find out the opinion of Teachers about the ‘Effectiveness of DIKSHA program in the English reader at Standard IX of Kerala’
- ◆ To find out the opinion of Students about the ‘Effectiveness of DIKSHA program in the English reader at Standard IX of Kerala’
- ◆ To find out whether there exist any significant difference in the effectiveness of DIKSHA program between the subsamples of the
 - i. Government School Teachers
 - ii. Aided School Teachers.
- ◆ To find out whether there exist any significant difference in the effectiveness of DIKSHA program between the sub samples of the
 - i. Government School Students
 - ii. Aided School Students

METHODS USED

The main aim of the study was to find the Effectiveness of Digital Infrastructure for Knowledge Sharing (DIKSHA) program in the English Reader of Standard IX of Kerala. The study requires the collection of data both in the qualitative and quantitative aspects as the research follows a mixed research design and statistical processing of the collected data with a view of obtaining answers to the stated objectives. Survey method were adopted to conduct the research, the required data was collected using opinionnaires among students

group, and teachers to understand the changes and developments occurred in the teaching learning process after the establishment of this program. Content analysis was chosen to understand the quality of content provided as part of DIKSHA program.

Opinionnaire is an information form that attempts to measure the attitude or belief of an individual. These opinions on different facts of the problem under study are further quantified, analyzed and interpreted.

Content analysis is concerned with the classification, organization and comparison of the content of the document or communication. Since content analysis is concerned with the classification, evaluation and comparison of the content of the communication of document, it is also considered as information analysis.

In the study, the investigator has used two separate opinionnaires for gathering the data from the selected samples. Both the opinionnaires were open-ended providing the samples to reflect their opinion on the effectiveness of DIKSHA program. With the help of the opinionnaires the researcher were able to collect information from 320 students and 100 teachers.

SAMPLE SELECTED FOR THE STUDY

“A sample is small proportion of a population selected for observation and analysis” (Best and Khan, 2009).The selection of sample is a pre requisite for the success of any research. The dependability of any study is determined largely by the selection of the sample. The sample selected should exhibit all the

properties of the population it represents. Samplings are of different types and in this study; the researcher adopted stratified random sampling technique.

Stratified sampling is a method of sampling that involves the division of a population into smaller sub groups known as strata. In stratified random sampling, the strata are formed based on members' shared attributes or characteristics. While employing the stratified random sampling technique the researcher divides his population into different strata by characteristics that are similar to the whole population. The usual stratification factors are age, sex, socio-economic status, educational background, residence (urban or rural), occupation, religion, caste, general intelligence and so on.

The study consists of a sample size of 100 teachers who teach English in grade IX at various Government and Aided schools of Kerala and 320 students of Grade IX selected through stratified random sampling technique from the various Government and Aided schools of Kerala. The samples were selected from the Middle and Northern regions of Kerala. Samples from the Malappuram district are the representations of Middle region of Kerala where as the samples from Kozhikkode, Wayanad, Kannur and Kasrgode represent the Northern region of the state. From these districts, two government schools and two aided schools were randomly selected for the sample of students. The teachers and students from both the urban and rural areas of the state are the part of the sample.

Table: 1 *Breakup of the final sample*

Sl. No.	Sample	No. of Individuals
1	English teachers of standard IX	100
2	Students of Standard IX	320
Total (N)		420

TOOLS EMPLOYED FOR COLLECTION OF DATA

Factual material unknown so far are very necessary for every study. This can be obtained from many sources. It is necessary to adopt a systematic procedure to collect the essential data. Relevant data having adequate quantity and quality should be collected. They should be sufficient, reliable and valid. The selection of a suitable tool is an important aspect of research work. The major tools and techniques used in the in the research of education are observation, interview and inquiry forms etc. Inquiry forms are considered as the most useful for this study. Thus, the tool used for collecting the required data was Opinionnaire on the effectiveness of DKSHA program in the English Reader of Standard IX.

Opinionnaire is a form containing a list of statements, each of which the members of a selected group are asked to ensure or reject; the purpose being to gather information for a survey. Best (1993) in his book *Research in Education* defines an opinionnaire as follows “the information form that attempts to measure the attitude or belief of an Individual is known as Opinionnaire.”

As the research aims to explore the effectiveness of DIKSHA program mixed research pattern was adopted by the investigator. Mixed research design gives emphasis to both the philosophical assumptions along with the methods of inquiry. As a method, it focuses on both the qualitative and quantitative approaches and this combination provides a better understanding of the problem handled by the investigator. A content analysis of the digital learning content provided through the quick response codes was decided as the strategy for qualitative approach of the study. In the quantitative approach for collecting the required data, an opinionnaire to suit the purpose was prepared and administered to the sample of population. In order to collect data from different groups that is students and teachers the investigator used two types of opinionnaires. They are :

- ◆ Opinionnaire on the opinion of teachers on the *Effectiveness of DIKSHA program in the English reader at Standard IX of Kerala* (Sareef and Greeshma, 2020)
- ◆ Opinionnaire on the opinion of students on the *Effectiveness of DIKSHA program in the English reader at Standard IX of Kerala* (Sareef and Greeshma, 2020)

Planning of the opinionnaire

The first step in the construction of these opinionnaires was planning. The opinionnaire for students on the effectiveness of DIKSHA program in the English reader consisted 25 item that were based on six focus areas. The six focus areas are i) Utility, ii) Relevance, iii) Content, iv) Skill development, v) self evaluation and vi) the opinion of students. On the other hand the opinionnaire for teachers

included 25 items that were based on seven focus areas and the focus areas included the i) purpose of the programme, ii) the features of the programme, iii) the utility of the programme, iv) the quality of the programme, v) the relevance of the programme vi) the functionality of the programme and vii) the opinion of teachers. Both these opinionnaires has three parts. Part-A, Part-B and Part-C. Part- A of the opinionnaire is a declaration from the investigators side pointing out the purpose of the study. Part- B of the opinionnaire is aimed at collecting the personal and general data regarding the teachers and learners. Items like name, gender and details regarding the institution are included in this part of the opinionnaire. Part –C of the opinionnaire is aimed at the analysis of the effectiveness of the program through the statements developed based on each area or components selected by the learners. Part- A of both the opinionnaires are similar but Part- B and part- C differ accordingly to the credentials, designation and components.

Preparation of the opinionnaire

Opinionnaire on the opinion of teacher on the effectiveness of DIKSHA program in the English reader of Standard IX.

The tool was intended to collect the opinion of teachers who teach English at grade IX in the Government and Aided schools of Kerala. The opinionnaire developed for teachers included 25 items out of which 24 was objective with relevant options and a question of descriptive format that was expected to be answered in a three or four sentences. The opinionnaires were developed based on the components and references were made whenever required from the resources

available on the features of DIKSHA program. The investigator collected the details of DIKSHA program from the websites of Government of India and of MHRD. The investigator developed this tool based on seven dimensions and all those statements included in the tool were based on this. Majority of the tools are favourable statements. The dimensions used for preparing the opinionnaire are classified and described under the categories given below.

The Purpose of the Program

This dimension aims to analyze the effectiveness of the purpose of this program. The major purpose of this program is to develop an alternative schooling or digital schooling and this dimension checks how well this objective is achieved.

Eg.: The QR Codes in English reader makes teaching effective

The Features of the Program

DIKSHA Program is developed inculcating some unique features such as Phygital Textbooks, Animated lessons etc. The investigator framed statements based on these dimensions in order to check the attitude of teachers toward these unique features.

Eg.: The QR Codes in English reader carries illustrations suitable for effective teaching.

The Utility of the Program

This dimension was developed in order to identify the popularity of DIKSHA program among teachers and to understand how well the teachers are familiar in using the program for developing an effective classrooms. This dimension also analyses how well the program is inculcated in the teaching learning process.

Eg.: The QR Codes in English reader act as an alternative for smart classrooms.

The Quality of the Program

This dimension thoroughly analyzes the quality of contents, quality of audios, videos, presentations and graphical animations used in this program since such elements are un avoidable in a digital learning material. The statements' regarding the quality of program tries to sort out teachers' opinion regarding the quality of the program, which place the lead role in the success of any program

Eg.: The QR Codes in English reader provides high quality digital content

The Relevance of the Program

DIKSHA program was established on 2019 and this increased the relevance as the world faced the attack of Covid-19 pandemic. This dimension aims to check how relevant the program is in this current scenario and how this program aids in the learning process.

Eg.: The QR Codes in English reader are effective in the COVID 19 context.

The Functionality of the Program

The program mainly functions through online modes and through mobile applications and web portals. This dimension aims to analyze how favourable this is in the teaching learning process.

Eg.: The QR Codes in English reader facilitates interaction and provides feedback

The Opinion of Teachers

Unlike the others, here the teachers are expected to state their opinion about the program as a whole mentioning its positives and negatives. Their suggestions for improvement can be mentioned under this. This would be analyzed along with the rest of the collected data.

Eg.: Limitations of the system and suggestions for improvement.

Opinionnaire on the opinion of students on the effectiveness of DIKSHA program in the English reader of Standard IX.

This tool too contained 25 items out of which 24 was objective and a question of descriptive format expected to be answered in two or more sentences on their suggestions about the program. The investigator developed this tool based on six dimensions and all those statements included in the tool were based on this. Majority of the tools are favourable statements. The dimensions used for

preparing the opinionnaire are classified and described under the categories given below.

Utility

This dimension was developed in order to identify the popularity of DIKSHA program among teachers and to understand how well the teachers are familiar in using the program for developing their learning abilities.

Eg.: The QR Codes in English reader helps to access knowledge easily

Relevance

Statements based on the relevance of the program on this Covid-19 pandemic situation are included to analyze how effective this program is in this current scenario.

Eg.: The QR Codes in English reader are effective now.

Content

The statements based on this dimensions aims to analyze the learners' opinion about the digital content provided through the program.

Eg.: The QR Codes in English reader are suitable for preparation of notes.

Skill Development

Skill development is one of the basic objectives of English language learning. Listening, Speaking, Reading and Writing are the basics of any

language. Through this dimension, the investigator tries to understand how well the program aids in the development of such skills required for the learner.

Eg.: The QR Codes in English reader are effective in developing the skill of writing.

Self Evaluation

The program provides notes, explanations and activities. This would help the learners to make an improvement in their learning. The statements based on this dimension analyze how well the program helps in the self-evaluation of the learner.

Eg.: The QR Codes in English reader are helpful for revision and self assessment.

The Opinion of Students

Unlike the others, here the teachers are expected to state their opinion about the program as a whole mentioning its positives and negatives. Their suggestions for improvement can be mentioned under this. This would be analyzed along with the rest of the collected data.

Eg.: Limitations and suggestions for improvement.

Finalization of the Opinionnaire

Considering the circumstances of pandemic data collection was supposed to be done through online and the tools prepared were converted to Google forms.

Necessary instructions were provided to teachers and students. Hence, the final opinionnaire had 25 items each in both these opinionnaires.

DATA COLLECTION PROCEDURE

The Covid-19 pandemic has been a challenge in the collection of data required for the study and the present condition demanded a turn from the traditional method of face-to-face data collection to the online mode. The data required for the study was conducted using Google forms. As the first step for data collection, the investigator collected the contact details of the authorities and teachers and explained the nature and confidentiality of the study. The final form of opinionnaires was distributed to teachers through Social media platforms such as WhatsApp. The opinionnaire for students was forwarded to them with the help of respective teachers. For making the procedure simple, the investigator explained the purpose of the study and necessary explanations through audio clippings to the students in each school. The investigator continuously monitored the responses from the teachers and students. Being an Opinionnaire there was no right or wrong question and the samples from teachers and students were expected to all the statements of the tool. The tools comprised of a two-point scale and the samples were expected to mark their opinion to each statement provided in the tool. If they strongly agree with the statement then they can mark in the first column and if they disagree with the statement given, they can mark in the second column. At the end of the opinionnaire teachers and students can write down their opinion on the programme and mark their suggestions for improvement regarding the program if there any in the allotted space and submit it by clicking the submit button in the Google forms.

The qualitative aspect of the program that is the theoretical effectiveness of the DIKSHA program is collected by analyzing the digital contents. The investigator for this as a sample selected the Kerala English reader of Standard IX. The Government of Kerala, accepting the digital education scheme of MHRD included QR Codes in the textbooks from the academic year of 2019- 2020. The English reader of Grade IX is divided into two volumes with the five units that consist of two poems and two prose pieces like stories, plays, etc written by famous writers. In each of these units a minimum of three QR Codes are placed. The investigator using the DIKSHA application scanned each of these through available gadgets such as android phones and made sure that each of these quick response codes are properly working. Alpha Numerical codes brought along with the Quick Response code were also verified using the DIKSHA web portal. The content analysis of these digital learning materials were done keeping in mind a set of components such as the objectives of the Unit, quality of content and the appropriateness of the content. The investigator also pointed out the problems in digital content and added some of the suggestions that would help in the further development of the program.

SCORING AND CONSOLIDATION OF DATA

All the tools were administered in a systematic manner. Since the data collection was done through online, the samples marked their opinion in the tool itself. So, separate response sheets were not required for this. The respondents had to mark their response either by selecting agree or disagree, hence the teachers and students marked their responses according to their choice. Data collected with the help of these tools were scored accordingly. Both these tools consisted of 25

items in which 24 were objective ones. A score of 2 is given to the response “ Agree” and a score of 1 is given to the response “disagree” for both the opinionnaires. The opinion of the teachers and students to the final question was analyzed qualitatively.

Validity of the Tool

Validity is defined as the extent to which a concept is accurately measured in a quantitative study. Validity refers to how accurately a method measures what it is intended to measure. If the research shows high validity that means the results of the study has a greater correspondence with the properties and characteristics of real or social world. The validity of the tool used for the present study was ensured using content validity and construct validity. A copy of the final version of the tool on the opinion of Teachers on the Effectiveness of DIKSHA program in the English reader of Standard IX at Kerala and opinion of students on the effectiveness of DIKSHA program in the English reader of standard IX at Kerala are appended as Appendix I and II.

STATISTICAL TECHNIQUES USED

Analysis of the collected data and its interpretation can be done only with the help of statistical techniques. Both the descriptive and inferential statistical techniques are used for the analysis of the data. The major statistical technique used for the analysis of data in the present study is percentage analysis.

Percentage Analysis

It refers to a special kind of rates. Percentage is used in making comparison between two or more series of data. A percentage is used to determine relationship between series. Percentage analysis is done using the following formula.

Percentage Analysis =

$$\frac{\text{No .of respondents}}{\text{Total number of respondents}} \times 100$$

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

-
- ◆ Objectives of the Study
 - ◆ Preliminary Analysis
 - ◆ Major Analysis
 - ◆ Conclusion
-

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

Analysis of Data means Categorizing, Ordering, Manipulating, and summarizing of data to obtain answers to the questions raised through research. Through data analysis, the researcher aims to reduce the available data to an intelligible and interpretable form to analyze the research problems and get it tested.

Analysis of data means studying tabulated material in order to determine inherent facts or meanings. It involves breaking down the existing complex factors into simpler parts and putting the parts together in new arrangements for purposes of interpretation. (Edger and Rao, 1996 Pg.71)

The data collected are analyzed after organizing the collected materials in order to discover the hidden facts. The collected data are studied in various ways to explore new facts. Once the process of data collection is accomplished, the analysis of data is conducted. It requires alertness, flexibility, and open-mindedness. It is worthy to prepare and plan the process of analysis before the actual collection of data. The process of interpretation is especially states what the results are likely to be. The data collected for research only becomes meaningful when it is analyzed and synthesized accordingly.

The analysis of data involves the objective material of the possession of the researcher and his subjective reactions and desires to derive from data, the inherent meaning in their reaction to the problem.

There are mainly two types of data: Qualitative and Quantitative. Qualitative data can be observed and recorded. This type of data is non-numerical. Such data are collected using the methods of observation, interview, focus groups and content analyzes. Qualitative data is all about the emotions and perceptions of people, what they feel, and how they perceive it. Quantitative data is any quantifiable information that can be used for mathematical calculation and statistical analysis. Statistical techniques have greatly contributed in collecting, organizing, analyzing, and interpreting the numerical data.

For the purpose of study qualitative data was gathered using content analysis where as percentage analysis was adapted as the statistical technique for analyzing the data collected which was collected using opinionnaire. Thus the analysis chapter of the study is described under the following headings:

- ◆ Review of the digital contents in DIKSHA Programme.
- ◆ Percentage Analysis

REVIEW OF DIGITAL CONTENTS IN DIKSHA PROGRAMME

Digital Infrastructure for knowledge sharing (DIKSHA) was introduced in Kerala syllabus from the academic year 2019-2020. As an initial step, the program was introduced in the textbooks of Standard IX and X.

The English reader of Standard IX is divided into two volumes, which as whole includes five units. All the units in the textbook are structured upon a particular theme consisting of three or four chapters and they occupy certain Q.R codes based on the chapters. The textbook is designed in a way that aims to

improve the proficiency of the learners in mastering English Language through meaningful, interesting, and interactive activities. QR codes imprinted in the textbook converts the traditional paper pack textbooks to a phygital textbook and provide digital assets to the learners through stories and poems.

Unit :1 Aspire to Win.

The first unit of the English reader is titled as Aspire to win and is framed by the theme of sports. The unit has three chapters included into it; two prose works and poetry. The whole unit consists of seven QR Codes. Each code is based on certain activities related to the respective chapters.

Table : 2 *List of QR Codes and related Activities.*

Sl. No.	Quick Response Code	Activity/ Content
1.	3EX4DQ	Commentary writing
2.	3F6ZFM	Commentary writing
3.	3FFVHA	Commentary writing
4.	3FPRIX	Video
5.	3FYMKK	Video
6.	3G8IM8	Animated series- Bobo
7.	3GHENV	Digital Glossary

The first chapter of the unit 'Aspire to win' is 'The Race' is a beautiful story written by Nisha Punjabi and consists of three QR Codes based on it. The first QR Code based on the story 3EX4DQ is based on commentary exercise that was provided as Activity five in the page 18 of the textbook. The major aim of the activity is to make the learners familiar with the role of Commentary in Sports and Games. The QR Code includes an animated version of the story that would help the learners in the activity. The video lengths three minutes and has subtitles in English that would aid the learners to understand the commentary. However, since the activity is was to make the learners familiarize with commentary writing along with the video there should be more examples of commentary with its features to be familiarized with the style as it stand out from the normal.

The second QR Code based on the story 'The Race' 3F6ZFM is imprinted on page 18 of the reader and it is an extension of the fifth activity based on the story. The activity is to identify the qualities of a good commentator. The QR code provides learners with digital version of the activity similar to the textbook were they could practice it virtually. This helps the learners to understand qualities of commentator and provides explanations when it goes wrong. The activity in its digital version could have made interactive using animation stressing upon the qualities of commentator at the end of the video that would help the learners to easily register into memory.

The QR Code 3FFVHA imprinted on the page 19 of the English reader is an activity based on commentary writing which is a sub section of activity number five of the story 'The Race'. The activity is to write a commentary on the finals of

Tri- Series cup between India and Srilanka that held on July 2013. Several screen shots of the final over of the match are provided in the textbook for this. The QR code includes live telecast of the last over of the match with the commentary that would help the learners to practice commentary writing. The major defect found with all these codes were it failed to provide the features of commentary writing.

The second chapter of the unit 'Aspire to win' is 'Learning the Game' by Sachin Ramesh Tendulkar. This is an extract from Sachin's autobiography and has three related activities. The final activity among the three is an activity on blog writing. As a model of reference, a piece of blog by Wilma Rudolph on her memories in connection with Olympics is also included. Based on this blog, a video of Wilma Rudolph's achievements in Olympics is given to learners in the form QR code 3FPRIX. However, the activity was to develop the skill of blog writing no information regarding blogs were provided in it. It could have more effect if the techniques and features of blog writing were also included.

The third chapter of first unit is 'Bang the Drum', a song by Bryan Adams and Nelly Furtado. The song was performed in the inaugural ceremony of winter Olympics held at Van cove in the year 2010. The QR Code 3FYMKK imprinted on page 31 of the English reader includes the live performance of the song during the inaugural ceremony. The language activities and grammatical activities based on the chapter and the entire unit is not included in with this code.

The English reader in each of its units has a cartoon series titled Bobo that aims to develop the learner's knowledge of the language. The series has is collaborated with DIKSHA program and has a QR code related to it. 3G81M8 is

the bobo series of first unit. The code provides the animated version of the series. Except the animated version of the series, the code does not include any activities based on it.

A digital glossary based on the unit glossary is provided in the form of QR codes at the end of the each unit. 3GHENV is the code for the unit glossary for the first unit 'Aspire to win'. The digital version of the glossary that is arranged in alphabetical order allows the learners to identify the meaning of the word, related images if any of the word, its actual pronunciation and an example based on the word by clicking the alphabets. No further activities related to the glossary are included in this code.

Unit : 2 Bonds of Love

The second unit of the English reader is titled as 'Bonds of Love'. The unit is framed under the theme of 'Sports'. The sub themes of the unit are selfless service, social ethics, and political integrity. The unit as a whole has three chapters that consist of two pieces of prose and poetry. Based on the three chapters the unit has four QR Codes in total.

Table : 3 *List of QR Codes and related Activities.*

Sl. No.	Quick Response Code	Content /Activity
1.	3GRAQI	Imperative sentences
2.	3HI656	Reported Speech
3.	3HA2TT	Video
4.	3HIXVG	Animated Series- Bobo
5.	3HSTX4	Unit Glossary

The first chapter of the unit is a story titled ‘Maternity’ written by Lilika Nakos. The first QR Code of the unit 3GRAQI is related to the first chapter and is imprinted on page 51 of English reader. It is an activity based on imperative sentences and the QR Code provides the animated version of the picture given in the textbook as a part of activity. Based on the video learners can understand different imperative sentence structures and practice it. Nevertheless, the code has some technical glitches while it is accessed using DIKSHA mobile application where as it works fine in the desktop version of DIKSHA.

The second Quick Response Code based on the unit is imprinted on page 54 of the Kerala English Reader. The code 3H16S6 is the second code related to the chapter Maternity and is imprinted on the activity section of the chapter. The second activity of the chapter which discusses the concept of Reported speech and Indirect speech are included as a animated video in this Quick Response code. The video is developed in the form of a conversation that occurs between a teacher and student. The same video also presents how a conversation is transformed into reported speech. The activity discusses both reported speech and indirect speech but the Quick Response Code only has videos related to reported speech and do not have any follow up activities.

The second QR Code based on the unit is included in the poem ‘Song of Dream’ written by Sarojini Naidu. The code 3HA2TT on page 55 is the digital version of the poem. The digital version of the poem that is about two minutes long is developed using photographs similar to the poem. The video is more like a

slide show and consists on the poem. The activities related to the poem are not mentioned in the code.

The cartoon animated series Bobo carries the third QR Code based on the unit. The code 3H1XVG is placed on page 72 of the English reader. Bobo is a cartoon series intended to develop the language skills of the learners and the QR Code is the animated version of the cartoon. The major limitation is that there is no provision for any further activities based on the animated series.

The final QR Code of the unit is placed on page number 73 and this is the digital version of the unit glossary. The code 3HSTX4 is the digital version of the glossary that is arranged in alphabetical order allows the learners to identify the meaning of the word, related images if any of the word, its actual pronunciation and an example based on the word by clicking the alphabets. No further activities related to the glossary are included in this code.

Unit 3 : Care for the Morrow

The third unit of the Kerala English is titled 'Care for the Morrow'. The unit is structured based on the theme of preservation of Nature. The unit includes three chapters and is based on the sub themes of Environmental issues, Natural phenomena, and Natural calamities. These three chapters are a combination of a play, poetry and a story. These three chapters has four quick response codes of which two of them are directly related to the chapters and the rest two are based on additional activities based on the chapters.

Table : 4 *List of QR Codes and related Activities.*

Sl. No.	Quick Response Code	Content/ Activity
1.	3I2PY2	Poem
2.	3IBL1E	Speech
3.	3IKH32	Animated series- Bobo
4.	3IUD4P	Unit Glossary

The first QR Code based on the unit ‘Care for Morrow’ is placed on page number 77 of the Kerala English reader. The code 3I2PYR provides the digital version of the poem ‘Song of the Rain’ written by Khalil Gibran. The video based on the poem is developed by SCERT by using pictures related to the poem. The overall structure of the video is similar to that of a slide show. The code only carries the digital version of the poem. The major limitation is that no further explanation for the poem is provided along with the poem and it does not cover any of the activities related to the poem.

The next QR Code of the unit ‘Care for the Morrow’ is imprinted on page number 93 of the textbook. The code 3IBL1E is from the chapter ‘Climate change is not hysteria- It’s a fact’. This is an extract of speech by famous actor Leonardo De Caprio at the UN climate summit. With the QR Code, the learner’s can watch the original clipping of the speech. The video would enable the learners to listen to English. This is the only QR code based on the whole chapter and it does not include the activities based on the chapter.

The cartoon series 'Bobo' intended for the development of language skills in learners carries the third QR Code of the unit. The code 31K3H2 is the animated version of the cartoon series based on the unit. The code does not have any further activities based on the series.

The glossary part of the unit carries the last QR Code. The QR Code 3IVD4P is placed on page 104 of the textbook. The digital glossary is the digitalized version of the unit glossary. In the digital version of the glossary, the words are arranged in an alphabetical order and provide the learners with facilities to understand the meaning of word through related images, phonetic transcriptions to improve pronunciation and examples based on the words.

Unit 4 : Dawn of Hope

The unit four of Kerala English reader is titled 'Dawn of Hope'. The entire unit is based on the theme 'power of hope' that includes three chapters in total that are structured on the subthemes such as inspiration, optimism, compassion, friendship, trust, conviction, sacrifice, life skills and disaster management. The three chapters comprises of two stories and a poem. The unit in total includes eight QR Codes linked to it. This is one of the units that include the most number of QR Codes in the two parts of the Kerala English reader.

Table : 5 List of QR Codes and related Activities.

Sl. No.	Quick Response Code	Content/ Activity
1.	34F5RA	Documentary
2.	34P1SX	Video
3.	34XWUV	Poem
4.	3GNXY	Animated story
5.	35QJZ1	Prepositions
6.	35ZG26	Animated series- Bobo
7.	3693CT	Unit Glossary

The first chapter of the unit is titled ‘The Jungle Air Crash’. The story is based on the real life experience of the author Juliane Koepcke. The chapter carries two QR Codes the first QR Code 34 F5RA. This code is a direct link to the entry activity to the chapter. The code carries the documentary on Ira Singhal, the topper of Civil Service Examinations, 2015. The documentary can enlighten the learners about the challenges they may face in their life. As an entry activity, it was closely related to the chapter. The QR Code does not mention any further activities based on the documentary.

The second code related to the chapter is 34P1SX, which is imprinted on page 122 of the textbook. The QR Code provides the video of plane crash met by Juliane Koepcke during her childhood. The video provides the learners with real

idea about the chapter. The QR Code related to this chapter does not include any activities based on the chapter.

The QR Code 34XWUV is the third code included in the unit, is printed on page number 129, and is related the poem written by Gieve Patel. The QR Code provides a video of the poem developed by SCERT using pictures relevant to pass the meaning of the poem. The video also has lines from the poem along with the pictures, but the lines are not explained in detail. The activities related to the chapter are not included in this QR Codes.

The last chapter of the unit ‘The last Leaf by O.Henry carries five different QR Codes based on the story. The first code related to the chapter is included in the activity session of the chapter. The activity five, which is a radio play, is based on the chapter.

The next code related to this chapter is imprinted on page 144 of the reader. The code 35GNXV is related to the language activities. The code carries the animated version of the story, The last leaf. This 12 minute long animated version deals with the major events in the story that helps in the proper understanding of the lesson. The video do not have any further activities for the learners even though the code is related to the language activities of the chapter.

The QR Code 35QJZ1 is an activity related to prepositions. The activity mentioned in the reader is to fill in the missing prepositions in the poem Send me an Angel written by Scorpions. The learners once they scan the QR Code can listen to the poem and can identify the prepositions which found missing in the lines. However, the activity was to identify the missing prepositions it does not

provide any instructions about the activity or do not have any follow up related to the activity.

Bobo the series is developed SCERT to familiarize the grammatical concepts to learners through cartoon series. The QR Code 35ZG26 included with this series allows the learners to see the animated version of the cartoon series. There are no additional activities based on the animated series.

The final QR Code of the unit is imprinted on page 160 of the English Reader. The QR Code 3693CT is related to the unit glossary and the code provides the digital version of the glossary. The digital glossary is the digitalized version of the unit glossary. In the digital version of the glossary, the words are arranged in an alphabetical order and provide the learners with facilities to understand the meaning of word through related images, phonetic transcriptions to improve pronunciation and examples based on the words.

Unit 5 : Enlightening Souls.

The unit five of the Kerala English reader is titled ‘Enlightening souls’. The entire unit is based on the theme of happiness that includes three chapters that are structured upon the sub themes of true happiness within us, need for open conversation, friendship and live in the present. The three chapters consist of two stories and a poem. The unit in total includes seven QR Codes. The unit also includes most number the most number of QR Codes similar to the previous unit of the textbook.

Table : 6 *List of QR Codes and related Activities.*

Sl. No.	Quick Response Code	Content/ Activity
1.	36I85G	Interactive activity
2.	36S474	Film version
3.	37IZ87	Film
4.	37AYA	Poem
5.	37JRC2	Film Version
6.	37TMDP	Animated series- Bobo
7.	383IFC	Unit Glossary

The first chapter of the unit is titled ‘The happiness Machine’. The chapter consists three QR Codes. The first QR Code of the chapter is based on an entry activity to the chapter, which is a language game. The code 36I85G imprinted on page 163 of the textbook is a response sheet to identify the happiness level of the learners. The QR Code provides the digital version of the response sheet where the learners can mark their responses. The activity is interactive as the answers are given descriptions accordingly even if it is supportive or against the argument. Further activities are not mentioned in this QR Code.

The second QR Code based on the chapter 36S474 which is related to the activities based on the activities based on chapter. The exercise is to complete the provided activity sheet by watching the film version of the story that is of 25

minutes long. The film provides the learners a complete idea of the story and would help in the completion of the activity. The QR Code does not provide any follow up activity.

The third and final QR Code based on the chapter The Happiness Machine 371Z8R imprinted on page 174 of the textbook is also related to the fourth sub section of the first activity of the chapter. The QR Code related to the activity includes a deleted scene from the film version of the story. The QR Code assists the learners to fulfill the activity since the activity was to complete the activity.

The next QR Code of the unit is placed on the page 178 of the English reader. The code 37AYA is related to the second chapter of the unit. The code provides the digital version of the poem 'A prayer in spring'. Written by Robert Frost. The digital version of the poem is developed using the pictures related to the lines of the poem. The video includes the line from the poem to respective pictures and provides the overall feeling of slide show. However, the video includes lines from the poem it does not provide any explanations for the poem. The code is the only one related to this chapter and the rest of the activities are not included in this QR Code and the existing code does not provide any instructions.

The chapter 'The Trio' carries the next QR Code of the fifth unit. The code 37JRC2 is imprinted on page 188 of the reader. The code carries the film version of the story 'The Trio' that actually belongs to the story collection Malgudi Days written by R. K. Narayan. The film version of the story in the QR Code version can help the learners in comprehending the main idea of the chapter. This chapter

includes both grammatical and language activities and these are not covered under this code.

Bobo the series carries the next QR Code of the unit. The Bobo series of this unit is placed on page 197 of the English reader with related code 37TMDP. The series is developed by SCERT especially considering the need of developing an idea about the various language and grammatical elements in English. The series in this unit mainly focuses on Prepositions. The related QR Code to this cartoon series provides the animated version to this series. The animated series are similar to the characters and conversation in the textbook. Further activities are not mentioned in this code.

The last QR Code of the English reader of Standard IX is related to the unit glossary. The related code 3831FC carries the digital version of the unit glossary. This is located at page 197 of the English reader. The digital version of the unit glossary consists of facilities such as phonetic transcriptions of all words, images related to the words, its respective meanings, and examples related to the novel words that can aid them in sentence constructions. The code does not carry any further descriptions or activities.

From analyzing the digital contents of that are a it was found that the contents have both possibilities and limitations. As part of DIKSHA program Educational department introduced QR Code imposed textbooks on classes IX and X from the academic year 2019- 2020. The QR Codes are imposed on textbooks of each subject of both grades IX and X. The English reader of Grade IX is the focus here. The textbook in total has 30 QR Codes based on the five

chapters that are distributed in two parts of the textbooks. Each chapter has more or less, than five QR Codes based on the theme and activities of the chapter. Each of these QR Codes was made to analyze using DIKSHA web portal and DIKSHA application that can be accessed through both apple store and Google play store. The digital contents are prepared exclusively by the experts of teachers and resource persons from State Council for Educational Research and Training (SCERT, Kerala).

The first unit in total had eight QR Codes. First and the third chapters had QR Codes but the second chapter from the unit lacked that are related to the chapter or related language or grammatical activities. The language related activities related to the unit was analyzed and it was identified that majority of the activity are left behind from the digitalization process

The second unit in total had three chapters and five corresponding QR codes. Unlike the unit, one number of QR Codes included in this unit is comparatively less. The third chapter of the unit is completely omitted from digitalization as it lacks QR Codes. The activity session that actually includes both the language related activities and grammatical activities are also left out from digitalization especially in the third unit.

The third unit of the reader 'Care for Morrow' has three chapters and four corresponding QR Codes. Once analyzed it was identified that chapter related QR Codes are only visible in the two chapters included in this unit. The third chapter of the unit is completely neglected from the digitalization process. Similar to the first two units of the Kerala reader the activity section of the unit is only given

less emphasize as it lacks enough number of QR Codes that would make learning process much more easier.

The fourth unit is titled as 'Dawn of Hope' with three chapters and related eight QR Codes. The trend of omitting lessons from digitalization continues as a chapter out of the three is completely neglected. Considering the effectiveness of the QR Codes in the language and grammatical activities, it was found that the number of QR Codes is considerably less.

The fifth unit of Kerala reader is titled 'Enlightening Souls'. The unit in total has three chapters with seven related QR Codes. Unlike the other units of the English reader, all the three chapters are digitally converted once it comes to the final unit. However, the activity section that carries both the language and grammatical activities of all the three chapters are neglected from digital conversions.

PERCENTAGE ANALYSIS

The second part of the study is Quantitative analysis of the data collected using Opinionnaires. The collected data was analyzed using Percentage analysis. Percentage analysis is adopted to know how many participants gave a particular answer. Percentage analysis is done by taking the frequency in the category divided by total number of participants and multiplying it by 100 percentage. Here, in the study data was collected from

- ◆ Students
- ◆ Teachers

Percentage Analysis of Students' Opinion

Results of the percentage analysis of the students on the effectiveness of DIKSHA programme is given in the table 7

Table : 7 *Opinion of Students on the Effectiveness of DIKSHA Programme in the English Reader of Standard IX*

Sl. No.	Statement	Agree (%)	Disagree (%)
1.	Helps to access knowledge easily	94 .1	5.9
2.	Are stimulating and interesting	92.2	7.8
3.	Makes learning simple	87.8	12.2
4.	Are effective now	92.8	7.2
5.	Provides virtual classroom at home	65.9	34.1
6.	Increases pace of learning	76	24
7.	Facilitates learning at any time	90.3	9.7
8.	Increases comprehension capacity	70.9	29.1
9.	Provides clear idea with animation	81.9	18.1
10.	Helps in familiarizing with new words	76.2	23.8
11.	Are suitable for preparation of notes	72.8	27.2
12.	Enables memorizing of contents easily	75	25
13.	Helps to learn in a short time span	85	15
14.	Provides ample notes and explanations	74.4	25.6
15.	Makes grammatical concepts simple	76.9	23.1
16.	Motivates for extra reading	60.4	40.6
17.	Assists in assignments completion	75.3	24.7
18.	Assists in discourse writing	92.8	7.2
19.	Helps in clarification of doubts	89.7	10.3
20.	Beneficial in improving skill of reading	75.6	24.4
21.	Effective in developing skill of writing	74.4	25.6
22.	Helpful in bettering skill of listening	84.1	15.9
23.	Worthy in improving skill of speaking	61.6	38.4
24.	Helpful for revision and self assessment	71.8	28.2

Discussion

Majority of the learners (94.1%) agreed that the program has helped them to access the knowledge easily whereas (5.9%) has opined they find difficulty in effortless access of knowledge.

The table also shows that (92.2%) of the learners responded that they felt that the QR Codes as quite stimulating and interesting where as the (7.8%) of the learners responded nothing stimulating and interesting was felt in using the QR Codes.

From the table it is understood that (87.8%) of the total sample opined that QR Codes helped them to make learning simple. On the other hand 39 students which is (12.2%) of the sample disagreed to this.

For the fourth item of the table (92.8%) students felt that the program is effective for learning in the COVID 19 situation. Out of the total sample (7.2 %) opined that they found The QR Codes less effective for learning in the current scenario.

It is visible from the table that (65.9%) of the total sample was in the opinion that the QR Codes in their English reader provided a feeling of virtual classroom but (34.1%) of was against this argument.

It is evident that (76%) of the total sample felt that the pace of their learning had a great impact with the QR Codes in the English reader. 24% of the sample opined against this.

For the item, seven in the table majority of the learners (90.3%) responded that QR Codes in their English reader has facilitated them the opportunities for studies irrespective of time. For the same, (9.7%) of the learners responded that they had the difficulties to assess the learning materials irrespective of time.

From analyzing the response of item 8 it was understood that (70.9%) of the total sample were able to comprehend the major ideas using QR Codes whereas (29.1%) was against this assumption

The responses for item 9 of the table clearly prove that most (81.9%) of the learners found supporting animations useful for easy comprehension of chapters. On the other hand, 18.1% of the responses marked that such supporting animations are not useful.

For the 10 item (76.2%) of the learners opinioned that digital glossaries helped with the modification of their pronunciations. However, (23.8%) of the learners viewed that digital glossaries could not bring any changes in their pronunciations.

Considering the responses for item 11 of the table shows that (72.8%) of the learners found QR Codes are worthy for note preparation. On the other hand, 27.2% of the learners opinioned that QR Codes was not useful for not making.

From the table it is clear that majority (75%) of the learners have been able to memorize the content with ease using QR Codes whereas (25%) of the learners opinioned that they could not find any changes in memorizing the chapters.

It is evident that for most (85%) of the learners attained knowledge in a short span using QR Codes. However, 15% of the learners opined that the codes could not create any changes in their pace of learning.

The responses for item 14 of the table proves that most (74.4%) of the learners found QR codes useful for explanations though (25.6%) of the learners was in the viewpoint that QR Codes were not adequate for explanations.

It is clear from the table that most (76.9%) of the learners are of the opinion that the QR codes made grammatical concepts simple for them. (23.1%) of the learners' impression is that QR codes alone are not enough for effortless understanding of grammatical concepts.

From the responses of 16 it is evident, that majority of the learners (60.4%) are motivated to do extra reading in English with digital contents yet 40.6% of the learners opinioned that QR codes never motivated them to do an extra reading English.

It is clear from the table that majority (75.3%) of the learners depended on the QR Codes in order to complete their tasks and assignments based on the chapter and found it effective. However, 24.7% of the learners think that QR codes will not help them to complete their tasks and assignments.

Considering the responses for item 18, it are clear, that majority of the learners (92.8%) have opinioned that QR Codes in their English learner helped them in practicing the language and grammar related activities. Nevertheless

(7.2%) of the learners believes that QR Codes are not worthy enough to practice the activities.

Item 19 of the table proves that most (89.7%) of the learners opinioned that the examples provided in activities helped them in proper comprehension of the concepts. However, 10.3% of the learners opinioned that the examples provided are not satisfactory and never helped them in the comprehension of chapters.

For the item 20 of the table majority (75.6%) of the learners opinioned that digitalized version of English reader has helped them very much in improving their reading skills. Nevertheless (24.4%) of the learners consider digitalized version of English was less effective in improving their reading skills.

It is evident that from the table that most of the learners (74.4%) felt that they had an effective development in their writing styles by using the digital glossaries. Yet the (25.6%) of learners considers digital glossaries as less effective in development of their writing styles.

Considering the responses from the table it is visible that majority (84.1%) of the learners has found QR Codes in their English reader effective in the betterment of their listening skills on the other hand (15.9%) of the learners opinioned that there was no changes in their listening skill by using the QR Codes.

For the item 23 of the table almost (61.6%) of the learners responded that they an improvement was felt in their speaking skills with the QR codes in their

English readers. Nevertheless (38.4%) of the learners responded that they did not have any improvement in their speaking skills by using QR Codes.

From the table it is clear that most (71.8%) of the learners had been able to analyze the progress of their studies using the QR codes in the English textbook. Yet it is visible that (28.2%) of the learners responded it as less helpful for the assessment of their progress in studies.

From the responses of the learners, it is evident that they had a clear-cut idea about the usage of QR Codes in their English reader though they were not familiar with the term DIKSHA and the aim of the program. Majority of the learners from the total sample size of 320 were supportive of the inclusion of QR Codes in their English reader and expressed their interest in understanding the use of QR Codes. Most of the learners were of the opinion that the QR Codes in their English reader has been very useful in their studies. Some of the students also emphasized how the QR Codes helped them to make their learning more effective and effortless in this COVID 19 pandemic period. In spite of all this positive aspects of the program learners pointed out the limitation they felt during receiving the assistance from the digital learning resources provided through QR Codes.

The major problems raised by the learners were related to the technological aspects. Most of the learners who were a part of the sample who are the beneficiaries of the program found difficulties in access the digital contents from QR Codes because of the poor network facilities in their localities. As a remedy for this issue the learners suggested that the program and digital contents

should be made available in both the modes, offline and online. They also suggested the need for an option of download for the future usage. The learners also pointed out the need to increase the number of quick response codes that was included in their English reader. Overall, after the analysis it was evident that the learners are satisfied with the performance of QR Codes in their English reader and identified that the digital contents had a great influence in their learning process in the notable circumstances of COVID 19.

Percentage Analysis of Teachers' Opinion

Results of the percentage analysis of the students on the effectiveness of DIKSHA programme is given in the table 8

Table :8 *Opinion of Teachers on the Effectiveness of DIKSHA Programme in the English Reader of Standard IX*

Sl. No.	Statement	Agree (%)	Disagree (%)
1.	Helpful for upgrading teaching methods.	84	16
2.	Requires continues training to achieve goal	72	28
3.	Provides instructions related to every activity	70	30
4.	Makes English language learning effective	92	8
5.	Makes English language teaching effective	90	10
6.	Are effective in the COVID 19 context	96	4
7.	Provides high quality digital content	72	28
8.	Effective in accomplishing learning outcomes	72	28
9.	Facilitates interaction and provides feedback	56	44
10.	Act as an alternative for smart classrooms	55	45
11.	Includes contents related to stated objectives	92	8

12.	Are helpful for teaching complex topics	67	33
13.	Facilitates students' learning process effectively	86	14
14.	Carries illustrations suitable for effective teaching	70	30
15.	Carries a pattern of language based on learners level	78	22
16.	Suggests model lesson plans for effective transaction	48	52
17.	Provides rubrics for evaluation of learning outcomes	82	18
18.	Provides proper explanatory videos	82	18
19.	Are beneficial for learners with special needs	77	23
20.	Provides demonstration classes	86	24
21.	Are integrated with real life experiences.	47	23
22.	Helps to evaluate previous knowledge	61	39
23.	Assists in accessing relevant materials	98	2
24.	Are systematically arranged	78	22

Discussion

From the table it is clear that for item 1 majority of the teachers (84%) opinioned that DIKSHA program motivated them to upgrade their methods of teaching and strategies. Whereas (16%) of the teachers was opinion they did not bring up any changes in their method of teaching and strategies.

It is clear from the table that most (72%) of the teachers believes that training sessions are need for getting familiarizing and achieving the goals of DIKSHA program. On the other hand (28%) of the teachers believes no such special trainings are need for familiarizing with the program.

Considering the responses for item 3 from the table it is evident that almost (70%) of the teachers' are on the opinion that prescribed teacher texts had enough explanations on the procedures for using QR Codes based on the chapters. Whereas (30%) of the opinioned that the explanations regarding QR codes were not enough for using it effectively.

It is clear from the table that majority of the teachers (92%) believes that English language learning can be made more interesting using DIKSHA program. Yet (8%) of the teachers believes that the program cannot bring any interest in English language learning within the learners.

From the item 5 it is understood that majority of the teachers (90%) consider DIKSHA program very helpful to make their teaching more effective. On the other, hand the (10%) of the teachers thinks that the program cannot make their teaching effective

For the item 6 most (96%) of the teachers opinioned that DIKSHA program is very effective in the COVID 19 pandemic period. Yet (4%) of the teachers opinioned that they felt the program is less effective in this pandemic period.

After analyzing the table, it is evident that almost (72%) of the teachers consider the quality of digital contents included with DIKSHA program the best. However, (18%) of the teachers are not satisfied with quality of the digital contents.

Considering the responses of item 8 it can be understood that almost (72%) of the teachers believes that with the help of DIKSHA program they were able to achieve the planned learning outcomes. On the vice versa, (18%) of the teachers believes that that cannot achieve the planned learning outcomes just by using DIKSHA program.

It is understood from the table that only (56%) of the teachers has the opinion that the Digital contents included in DIKSHA program are interactive. The rest (44%) of the teachers are in the opinion that the digital contents are less interactive and fails to provide feedback to learners.

It is evident from the table that item 10 that only (55%) of the teachers consider DIKSHA program as an effective replacement for smart classrooms at schools. Whereas (45%) of the teachers opinions that DIKSHA program cannot replace the role of smart classrooms in teaching learning process.

The analysis of the responses for item 11 makes proves that majority (92%) of the teachers' opinion are that the digital contents are developed considering the objectives of the unit while (8%) of the teachers opinioned that digital contents was not in accordance with the stated objectives of the unit.

From the table it is clear that most of the teachers (67%) has considered DIKSHA program as a perfect aid to teach the complex grammatical concepts to learners whereas (33%) of the teachers opinioned that the digital contents in DIKSHA program are not enough to teach the complex topics of English grammar.

For the item 13 majority (86%) of the teachers has opined that DIKSHA program can facilitate students' learning. while (14%) of the teachers has opined that DIKSHA program cannot effectively facilitate students' learning.

The analysis of the item 14 proves the majority (70%) of the teachers agrees that digital contents in DIKSHA program carries suitable illustrations that will enhance the effectiveness of teaching process. while (30%) of the teachers responded that they found the animations as less suitable to enhance the effectiveness of teaching process.

From the responses for item 15 it is visible that almost (78%) of the teachers approves that the digital contents of DIKSHA program carries a language pattern which is suitable for all learners. Whereas (22%) of the teachers opined that the language pattern itself is not suitable for learners with different comprehension level.

It is evident from the table that majority (52%) of the teachers considers the model lesson plan suggested through DIKSHA program are not useful in the proper planning of lessons. Yet (48%) of the teachers opined that the model lessons have helped them for the proper planning of lessons.

Considering the responses for item 17 it is clear that (82%) of the teachers relies on the special rubrics suggested by DIKSHA in order to analyze the effectiveness of the expected learning outcomes. However, (18%) of the teachers opined that they never rely on rubrics to analyze the effectiveness of learning outcomes.

From the table it is clear that majority (80%) of the teachers' supports the view point that the explanation videos helped them to deal with complex topics. Whereas 20% of the teachers were of the opinion that the digital contents provided using, QR Codes are not only enough to deal with the complex topics of English.

It is clear from the table that for the 19th item majority (77%) of the teachers were on the opinion that the audio resources provided using QR Codes are useful for the learners with special needs. However, (23%) of the teachers consider the audio resources are not worthy enough for the learners with special needs.

Considering the responses for item 20 from the table it is clear that most (76%) of the teachers agree that the demonstration included in the form of QR Codes are effective. Nevertheless, (14%) of the teachers were against this argument.

From the table it is clear that majority (53%) of the teachers have the opinion that digital contents are not related to the real life scenario. Yet, (47%) of the teachers agree to this viewpoint of the relation of digital contents with real life scenario.

From the responses for the 22nd item from the table, it is clear that most (61%) of the teachers agree to the fact that digital contents provided through QR Code could help them in refreshing the topics that was dealt in the class. However, (39%) of teachers opinioned that this is not worthy in refreshing and revision of the contents.

While analyzing the responses for the next item from the table it was evident that the majority (96%) teachers support the argument that they were able to access the digital contents using QR Codes provided in the textbooks. Yet, (4%) of the teachers found it difficult access the digital contents through QR Codes provided in the reader.

Considering the responses for item 24 from the table, it is clear that most of the teachers (78%) opined that intervals between the slide shows help them to explain the concepts to the learners. Whereas 22% of the total sample opined that the intervals are not worthy for explaining topics.

In order to identify the effectiveness of QR Codes in the English reader of Grade IX opinion from 100 teachers of English language across Kerala were collected. From analyzing their opinion, it was understood that majority of the teachers from the total sample favored the process of digitalizing the learning materials and the DIKSHA initiative brought up by the Ministry of Education. Teachers found that the QR Codes and digital learning materials were much effective in the process of teaching especially considering the circumstances brought up by the COVID 19 pandemic. Technological limitations were pointed out the teachers like the case of learners. Majority of the teachers mentioned that their students had issues related to the availability of internet facilities at home and nearby localities. The considerably limited number of QR Codes we mentioned by majority of teachers and suggested inclusion of more QR Codes in the English reader. Some of the teachers suggested the inclusion of previous year question paper digitally using QR codes in the English reader that would enhance

the result of the teaching learning process. Overall, teachers are satisfied with the quality and appropriateness of the digital content included in the DIKSHA program.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSION AND SUGGESTIONS

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- ◆ Study in Retrospect
 - ◆ Major Findings of the Study
 - ◆ Educational Implications
 - ◆ Suggestions for Further Studies
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CHAPTER V

SUMMARY, FINDINGS, CONCLUSION AND SUGGESTIONS

In this chapter, an assimilation of what had already done so far in the previous chapters is discussed by presenting the major findings of the study. In the light of the major findings, some recommendations for improvement and suggestions for further research are proposed. The chapter is organized under the following headings.

- ◆ Study in retrospect
- ◆ Major findings of the study
- ◆ Educational implications
- ◆ Suggestions for further studies.

STUDY IN RETROSPECT

This section tries to make a retrospective study of different stages of the present study such as the title, variables of the study, objectives of the study, hypotheses, and methodology used for the study.

Statement of the Problem

An Evaluation of the *Effectiveness of Digital Infrastructure for Knowledge Sharing (DIKSHA) program in the English reader at Standard IX of Kerala.*

Variable of the Study

‘An Evaluation on the effectiveness of DIKSHA program’ is the variable in the proposed study.

Objectives of the study

1. To find out the effectiveness of DIKSHA program in the learning of English.
2. To review the quality of digital contents in DIKSHA program.
3. To find out the opinion of Teachers about the effectiveness of DIKSHA program
4. To find out the opinion of Students about the effectiveness of DIKSHA program.
5. To find out whether there exist any significant difference in the effectiveness of DIKSHA program between the subsamples of the
 - i) Government School Teachers
 - ii) Aided School Teachers.
6. To find out whether there exist any significant difference in the effectiveness of DIKSHA program between the sub samples of the
 - i) Government School Students
 - ii) Aided School Students

Methodology

Sample

The population for the study comprises of teachers and students of Secondary level. The sample consist of 320 students from the class IX of State board from all over Kerala and 100 teachers of English teaching at class IX in the Government or Government aided schools all over Kerala.

Tools for Data Collection

To measure the variable Effectiveness of DIKSHA program two Opinionnaires developed by the investigator in collaboration with the supervising teacher were used.

Statistical Techniques

Data was analyzed and interpreted using percentage analysis.

MAJOR FINDINGS OF THE STUDY

- ◆ It is clear from the study that 100 percent of the learners are aware about the use of QR Codes in their English reader.
- ◆ The digital contents provided using QR Codes are according to the objectives of Kerala English reader.
- ◆ The study reveals that there are not enough QR Codes in the English reader.
- ◆ From this study, we understood that QR Codes in English reader are effective in this COVID pandemic period.
- ◆ The numbers of QR Codes are comparatively less in the first part of the English reader.
- ◆ QR Codes are mainly concentrated on chapters. The language and grammatical activities are given less priority in the process of digitalization of contents.
- ◆ It is evident from the analysis that some of the chapters are neglected from the

process of digitalization or does not carry any related QR Codes.

- ◆ From the study, we understood that instructions for using QR Codes are not provided in the English reader.
- ◆ From the study, it is clear that the instructions for completing an activity were not provided digitally.
- ◆ It is evident from the study 94 percent of the learners felt at ease to gather knowledge using QR Codes imprinted on their English reader.
- ◆ It is clear from the study that 89 percent of the learners relied on QR Codes in the English reader and it served as an aid for them in their learning process.
- ◆ From the study it is clear that digital resources provided through QR Codes developed enthusiasm and interest in learners to effectively process their learning.
- ◆ The study reveals that students relied on digital learning contents provided using QR Codes to make their learning more effective in the Covid 19 crisis period
- ◆ It is clear from the study that 87 percent of the learners through using the QR Code based digital contents made their process of English language learning effortless.
- ◆ 76 percent of the learners increased their pace learning and comprehension of language using the digital contents provided to them in the form of QR Codes.
- ◆ 90 percent of the learners found that digital resources combined with QR

Codes would facilitate their process of learning without the barriers of time and place.

- ◆ 70 percent of the learners were able to comprehend the real theme of the chapters by combining the digital materials with that of their English readers.
- ◆ 81 percent of the learners were attracted towards the animated digital contents based on their chapters and developed a clear understanding about the idea that was meant to be conveyed.
- ◆ 76 percent of the learners enriched their vocabulary and modified their pronunciation using the digitalized version of unit glossaries
- ◆ 72 percent of the learners after using digitalized version of the English reader were able to prepare the relevant notes themselves that made them independent learners.
- ◆ 75 percent of the learners developed their skill of memorizing the content after combining their learning materials and digital materials provided using QR Codes.
- ◆ 85 percent of learners making use of the digital contents improved their timing in understanding the concepts that makes the process of knowledge gaining more effective and effortless.
- ◆ 74 percent of the learners found that digital resources provided to them in the form of QR Codes had enough notes and explanations that that made their learning process effortless.
- ◆ 76 percent of the learners felt that that the digitalized versions of grammatical

concepts aided them in the proper comprehension of complex grammatical elements.

- ◆ 60 percent of the learners was motivated and developed a visible interest in reading by being inspired from the digital contents provided to them in the form of QR Codes.
- ◆ 75 percent of the learners relied on digital learning materials for the systematic completion of assignments and home works, which are an inevitable part of their learning process.
- ◆ 92 percent of the learners relies on digitalized learning materials for the practicing the grammar and language related activities with respect to its complexity and relevance in the process of examination system.
- ◆ 89 percent of the learners were able to improve their comprehension ability with a proper understanding as the digital learning resources helped them in doubt clarification through simple and relevant examples without the barriers of time and place.
- ◆ 76 percent of the students had a visible development in their skill of reading with proper stress and intonation with the assistance of digitalized learning materials provided to them in the mode of QR Codes.
- ◆ 74 percent of the learners had a satisfying development in their skill of writing by receiving the assistance from the digital learning materials as it provides digital glossaries aiding them in construction of sentences and making them familiarize with new words.

- ◆ 84 percent of the learners had a development in their listening skills as the digital resource provides videos based on the chapters with English audios.
- ◆ 61 percent of the learners had betterment in their speaking skills through listening to the digital resources including videos provided in the form of QR Codes on a regular basis.
- ◆ 71 percent of the learners found the digital resources helped them in proper revision without the barriers of time and place and allows them to have a self-evaluation.
- ◆ 84 percent of the teachers updated their teaching methods and strategies in order to effectively transact the digital contents that are provides through QR Codes as a part of DIKSHA program.
- ◆ 72 percent of the teachers felt the need for continuous training on the aim of DIKSHA program that would help the teachers to enrich their professional development.
- ◆ 70 percent of the teachers support the concept of Phygital textbooks, as the phygital textbooks provides them with proper and relevant explanations.
- ◆ 92 percent of the teachers felt an enthusiasm and interest in learners while learning using digital resources.
- ◆ 90 percent of the teachers combined the traditional method of teaching and digitalized teaching learning materials that showed a visible development their effectiveness of teaching.
- ◆ 96 percent of the teachers found DIKSHA program an effective way for

teaching learning process in this COVID 19 pandemic period.

- ◆ 72 percent of the teachers are satisfied with the quality of digital contents provided to the learners in the form of QR Codes as a part of DIKSHA program.
- ◆ 72 percent of the teachers achieved the learning outcomes implied in their lesson plans using digital contents. The proper accomplishment of learning outcomes would result in the proper transaction of learning materials.
- ◆ 56 percent of the teachers found that the digital resources provided as QR Codes are less interactive and fails to provide proper feedback to the learners. Proper interaction and feedback would encourage the learners.
- ◆ 55 percent of the teachers considers DIKSHA program as an effective replacement for smart classrooms. DIKSHA program provides the learners with digitalized learning materials and enables them to be self-dependent learner.
- ◆ 92 percent of the teachers considers the digital contents are framed accordingly to the theme and pre stated objectives of the Kerala English reader.
- ◆ 67 percent of the teachers relied on the digital learning materials provided as QR Codes for the effective transaction of complex topics. Complex topics such as language elements and grammatical elements are digitalized as animated videos that would help in the effective transaction of such contents.
- ◆ 86 percent of the teachers promotes the collaboration of normal textbook and

digital material based learning to students. This hybrid method of learning would make the process much effective.

- ◆ 70 percent of the teachers support the digital learning materials as it contains proper illustrations and animations that would make teaching much more effective.
- ◆ 70 percent of the teachers felt that the language used in the digital learning materials are appropriate to the level of learners. Proper use of language would increase the effectiveness of teaching learning process.
- ◆ 52 percent of the teachers found that model lesson plans provided through DIKSHA program were not appropriate for accomplishing certain learning outcomes and were not much effective.
- ◆ 80 percent of the teachers consider the explanatory videos provided digitally for complex topics as effective for successfully transacting them. Such videos and explanations would increase the comprehension level of learners and would decrease the effort of the teachers.
- ◆ 77 percent of the teachers felt that audio resources provide through QR Codes are effective for transacting the contents to students with special needs.
- ◆ 86 percent of the teachers effectively makes use of demonstration classes on each topics that are provided digitally in the form of QR Codes by accessing it from both DIKSHA portal and mobile application.
- ◆ 54 percent of the teachers identified digital learning materials provided through DIKSHA program are purely based on textbook related contents and

neglected the real life examples. Examples from real life can increase students' level of understanding.

- ◆ 61 percent of the teachers consider digital contents provided using DIKSHA program would increase the comprehension level of learners and would help in the recollection of previous knowledge require for the assimilation and accommodation of new concept.
- ◆ 96 percent of the teachers prefer to use DIKSHA application rather than DIKSHA web portal to access digital contents.
- ◆ 88 percent of the teachers collaborates the textbooks along with digital learning materials by making use of the intervals of the digital contents.

EDUCATIONAL IMPLICATIONS OF THE STUDY

The result of the study has important implications in the field of digitalization of education and educational materials. As it is, an era of Globalization and the learners are meant to be the future global citizens, their access to education should be updated to the most innovative strategies and technologies from time to time without fail. Digital Infrastructure for Knowledge Sharing (DIKSHA) as an novel innovation in the field of digital education opens a new world of opportunities for teachers and learners for enriching the effectiveness of teaching- learning process.

The program promotes personalized learning to every learners who are its beneficiaries by making them self dependent and self motivated. DIKSHA program also ensures the learners extended learning opportunities that would

ensure a higher engagement rate through the limitless availability of images and video contents that makes the learning process more engrossing and smooth for students to grasp the contents.

For teachers the digital learning materials provided through DIKSHA program provides an access to explore new teaching opportunities by combining the traditional technological materials together that would result in the more effective way of content transaction.

In conclusion, DIKSHA program brings together both the synchronous and asynchronous delivery of learning materials together. In the case of synchronous delivery of content which is a real life process where the learners receives the information simultaneously and communicate directly to other learners. the digital learning contents offered through DIKSHA program can be utilized in a real life classroom through a sophisticated technological support whereas can be great aid to learners and teachers through enabling effective content transaction asynchronously in difficult times such as natural calamities, pandemics and emergencies etc.

SUGGESTIONS FOR FURTHER RESEARCH

The findings of the study and limitations encountered during the present study helped the investigator to suggest the following areas for further research.

- ◆ A study on the effectiveness of DIKSHA program in Science subjects can be carried out.

- ◆ A study on the prospects and problems of Digital education in India in the

light of DIKSHA program can be carried out.

- ◆ A study on the opinion of subject experts and resource persons about the effectiveness of DIKSHA program can be conducted.
- ◆ Studies can be conducted to identify the effectiveness of DIKSHA program in the upper primary and primary classes.
- ◆ Studies to identify the opinion of parents regarding the digitalization of education and educational resources can be conducted.
- ◆ Studies can be conducted to identify the influence of digital contents on learners can be conducted.
- ◆ A study on the attitude of teachers and students regarding the effectiveness of digital contents can be carried out.
- ◆ A study on the relation between the effectiveness of digital learning materials and achievement of learners in the perspective of DIKSHA program can be carried out.

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APPENDICES

APPENDIX I

FAROOK TRAINING COLLEGE

Research Centre in Education

OPINIONNAIRE FOR STUDENTS ON THE EFFECTIVENESS OF DIKSHA PROGRAMME IN THE ENGLISH READER OF STANDARD IX

Mohammed Sareef

Assistant Professor

Farook Training College

Greeshma. M

M.Ed Student

Farook Training College

INSTRUCTIONS

The purpose of the survey is to collect the data regarding the effectiveness of QR Codes in the English reader of Standard IX. You are requested to provide answers for all the questions and I assure you that the information given by you would only be used for study purpose.

The QR Codes in my English Reader :

- | | | |
|--|----------|-------------|
| 1. Helps me to access knowledge easily | A) Agree | B) Disagree |
| 2. Are quite stimulating and interesting | A) Agree | B) Disagree |
| 3. Makes my learning simple | A) Agree | B) Disagree |
| 4. Are effective now | A) Agree | B) Disagree |
| 5. Provides virtual class room at home | A) Agree | B) Disagree |
| 6. Increases my pace of learning | A) Agree | B) Disagree |
| 7. Facilitates learning at any time | A) Agree | B) Disagree |
| 8. Increases comprehension capacity | A) Agree | B) Disagree |
| 9. Provides a clear idea with Animation | A) Agree | B) Disagree |

10. Helps in familiarizing new words A) Agree B) Disagree
11. Are suitable for preparation of notes A) Agree B) Disagree
12. Enables memorization of contents easily A) Agree B) Disagree
13. Helps to learn in a short time span A) Agree B) Disagree
14. Provides ample notes and explanations A) Agree B) Disagree
15. Makes grammatical concepts simple A) Agree B) Disagree
16. Motivates for extra reading A) Agree B) Disagree
17. Assists in assignment completion A) Agree B) Disagree
18. Assists in discourse writing A) Agree B) Disagree
19. Helps in clarification of doubts A) Agree B) Disagree
20. Beneficial in improving skill of reading A) Agree B) Disagree
21. Effective in developing skill of writing A) Agree B) Disagree
22. Helpful in bettering skill of listening A) Agree B) Disagree
23. Worthy in improving skill of speaking A) Agree B) Disagree
24. Helpful for revision and self assessment A) Agree B) Disagree
25. Limitation of this system and suggestions for improvement

APPENDIX II

FAROOK TRAINING COLLEGE

Research Centre in Education

OPINIONNAIRE FOR TEACHERS ON THE EFFECTIVENESS OF DIKSHA PROGRAMME IN THE ENGLISH READER OF STANDARD IX

Mohammed Sareef
Associate Professor
Farook Training College

Greeshma M.
M.Ed Student
Farook Training College

INSTRUCTIONS

The purpose of the survey is to collect the data regarding the effectiveness of QR Codes in the English reader of Standard IX. You are requested to provide answers for all the questions and I assure you that the information given by you would only be used for study purpose.

The QR Codes in my English Reader :

1. Helpful for upgrading teaching methods A) Agree B) Disagree
2. Requires continues training to achieve goal A) Agree B) Disagree
3. Provides instructions related to every activity A) Agree B) Disagree
4. Makes English language learning effective A) Agree B) Disagree
5. Makes English language teaching effective A) Agree B) Disagree
6. Are effective in the COVID 19 context A) Agree B) Disagree
7. Provides high quality digital content A) Agree B) Disagree
8. Effective in accomplishing learning outcomes A) Agree B) Disagree

9. Facilitates interaction and provides feedback A) Agree B) Disagree
10. Act as an alternative for smart classrooms A) Agree B) Disagree
11. Includes contents related to stated objectives A) Agree B) Disagree
12. Are helpful for teaching complex topics A) Agree B) Disagree
13. Facilitates students' learning process effectively A) Agree B) Disagree
14. Carries illustrations suitable for effective teaching A) Agree B) Disagree
15. Carries a pattern of language based on learners level A) Agree B) Disagree
16. Suggests model lesson plans for effective transaction A) Agree B) Disagree
17. Provides rubrics for evaluation of learning outcomes A) Agree B) Disagree
18. Provides proper explanatory videos A) Agree B) Disagree
19. Are beneficial for learners with special needs A) Agree B) Disagree
20. Provides demonstration classes A) Agree B) Disagree
21. Are integrated with real life experiences A) Agree B) Disagree
22. Helps to evaluate previous knowledge A) Agree B) Disagree
23. Assists in accessing relevant materials A) Agree B) Disagree
24. Are systematically arranged A) Agree B) Disagree
25. Limitation of this system and suggestions for improvement

AN EVALUATION OF THE EFFECTIVENESS OF DIKSHA PROGRAM IN THE ENGLISH READER OF STANDARD IX OF KERALA (OPINIONNAIRE FOR STUDENTS)

I am Greeshma. M, M.Ed student of Farook Training College, Calicut. This Opinionnaire is a part of my research work meant for the fulfillment of the course. The purpose of the survey is to collect the data regarding the effectiveness of Q.R. Codes in the English reader of Standard IX. You are requested to provide answers for all the questions and I assure you that the information given by you would only be used for study purpose.

* Required

Skip to question 1 *Skip to question 1*

BASIC INFORMATION.

1. Name of the Student *

2. Gender *

Mark only one oval.

Male

Female

3. Name of the School *

4. Type of the Institution *

Mark only one oval.

Government

Aided

5. Locality of the school *

Mark only one oval.

Rural

Urban

Skip to question 6

OPINIONNAIRE

The Q.R. Codes in my English reader

6. 1. Helps me to access knowledge easily *

Mark only one oval.

Agree

Disagree

7. 2. Are quite stimulating and interesting *

Mark only one oval.

Agree

Disagree

8. 3. Makes my learning simple *

Mark only one oval.

Agree

Disagree

9. 4. Are effective now *

Mark only one oval.

Agree

Disagree

10. 5. Provides virtual class room at home *

Mark only one oval.

Agree

Disagree

11. 6. Increases pace of learning *

Mark only one oval.

Agree

Disagree

12. 7. Facilitates learning at any time *

Mark only one oval.

Agree

Disagree

13. 8. Increases comprehension capacity *

Mark only one oval.

Agree

Disagree

14. 9. Provides clear idea with animation *

Mark only one oval.

Agree

Disagree

15. 10. Helps in familiarizing new words *

Mark only one oval.

Agree

Disagree

16. 11. Are suitable for preparing of notes *

Mark only one oval.

Agree

Disagree

17. 12. Enables memorization of contents easily *

Mark only one oval.

Agree

Disagree

18. 13. Helps to learn in a short time span *

Mark only one oval.

Agree

Disagree

19. 14. Provides ample notes and explanations *

Mark only one oval.

Agree

Disagree

20. 15. Makes grammatical concepts simple *

Mark only one oval.

Agree

Disagree

21. 16. Motivates for extra reading *

Mark only one oval.

Agree

Disagree

22. 17. Assists in assignment completion *

Mark only one oval.

Agree

Disagree

23. 18. Assists in discourse writing *

Mark only one oval.

Agree

Disagree

24. 19. Helps in clarification of doubts *

Mark only one oval.

Agree

Disagree

25. 20. Beneficial in improving skill of reading *

Mark only one oval.

Agree

Disagree

26. 21. Effective in developing skill of writing *

Mark only one oval.

Agree

Disagree

27. 22. helpful in bettering skill of listening *

Mark only one oval.

Agree

Disagree

28. 23. Worthy in improving skill of speaking *

Mark only one oval.

Agree

Disagree

29. 24. Helpful for revision and self assessment *

Mark only one oval.

Agree

Disagree

Option 3

Option 4

30. 25. Limitation of this systems and suggestions for improvement *

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AN EVALUATION OF THE EFFECTIVENESS OF DIKSHA PROGRAM IN THE ENGLISH READER OF STANDARD IX OF KERALA. (OPINIONNAIRE FOR TEACHERS)

I am Greeshma. M, M.Ed student of Farook Training College, Calicut. This Opinionnaire is a part of my research work meant for the fulfillment of the course. The purpose of the survey is to collect the data regarding the effectiveness of Q.R. Codes in the English reader of Standard IX . You are requested to provide answers for all the questions and I assure you that the information given by you would only be used for study purpose.

* Required

Skip to question 1 *Skip to question 1*

BASIC INFORMATION

1. Name of the Teacher *

2. Gender *

Mark only one oval.

Male

Female

3. Name of the School *

4. Type of Institution *

Mark only one oval.

Government

Aided

5. Locality of the School *

Mark only one oval.

Rural

Urban

Skip to question 6

OPINIONNAIRE

Quick Respond Codes as a part of DIKSHA Programme in English Reader

6. 1. Are helpful for upgrading teaching methods *

Mark only one oval.

Agree

Disagree

7. 2. Requires continuous training to achieve goal *

Mark only one oval.

Agree

Disagree

8. 3. Provides instructions related to every activity *

Mark only one oval.

- Agree
 Disagree

9. 4. Makes English language learning effective *

Mark only one oval.

- Agree
 Disagree

10. 5. Makes English language teaching effective *

Mark only one oval.

- Agree
 Disagree

11. 6. Are effective in the COVID 19 context *

Mark only one oval.

- Agree
 Disagree

12. 7. Provides high quality digital content *

Mark only one oval.

- Agree
 Disagree

13. 8. Effective in accomplishing learning outcomes *

Mark only one oval.

- Agree
 Disagree

14. 9. Facilitates interaction and provides feedback *

Mark only one oval.

- Agree
 Disagree

15. 10. Act as an alternative for smart classrooms *

Mark only one oval.

- Agree
 Disagree

16. 11. Includes contents related to stated objectives *

Mark only one oval.

- Agree
 Disagree

17. 12. Are helpful for teaching complex topics *

Mark only one oval.

- Agree
 Disagree

18. 13. Facilitates students' learning process effectively *

Mark only one oval.

Agree

Disagree

19. 14. Carries illustrations suitable for effective teaching *

Mark only one oval.

Agree

Disagree

20. 15. Carries a pattern of language based on learners level. *

Mark only one oval.

Agree

Disagree

21. 16. Suggests model lesson plans for effective transaction *

Mark only one oval.

Agree

Disagree

22. 17. Provides rubrics for evaluation of learning outcomes *

Mark only one oval.

Agree

Disagree

23. 18. Provides proper explanatory videos *

Mark only one oval.

Agree

Disagree

24. 19. Are beneficial for learners with special needs *

Mark only one oval.

Agree

Disagree

25. 20. Provides demonstration classes *

Mark only one oval.

Agree

Disagree

26. 21. Are integrated with real life experiences. *

Mark only one oval.

Agree

Disagree

27. 22. Helps to evaluate previous knowledge *

Mark only one oval.

Agree

Disagree

28. 23. Assists in accessing relevant materials *

Mark only one oval.

Agree

Disagree

29. 24. Are systematically arranged *

Mark only one oval.

Agree

Disagree

30. 25. Limitation of this systems and suggestions for improvement *

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