

**Position Paper on
PUBLICATION OF
QUALITY TEXTUAL AND NON - TEXTUAL MATERIAL
: ISSUES, CHALLENGES AND WAY FORWARD
(PP-21)**

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1. INTRODUCTION

Quality is the result of an Intelligent and sustained effort to produce the Best that a product could possess with the stipulated infrastructure and raw materials, in relation to cost, time limitations and the capabilities of the facility. Quality for the publications is therefore an exclusive operation that forms an integrated part of every phase of production from conception till the publication is delivered to the student, with acceptable standards.

However good, may be the content of the textual material, unless it is presented in an attractive and pleasantly readable format the objectives cannot be achieved. This is where the concept of quality publication gains importance. Generally in any education policy focus will be on the Curriculum and its depth and breadth but it is also equally important to publish the same with the optimum quality levels and this would certainly help in pedagogy.

Text books are the Traditional publications in the Education field. It is also to be noted that the National Education Policy 2020, has emphasized the importance of Early Childhood Care and Education (Chapter-1) and Online and Digital Education (Chapter-24). The Changed environment, Technological/Economic Growth and recent rise in Pandemic has made the system to look for alternative initiatives for the the Education. Further it is also worth considering the popularity being gained by the Montessori methods of teaching.

Therefore, the Publications in the education system attains definition beyond the traditional text books. Learning may take place beyond the boundary of textbooks and the classroom; it may take place through a diversity of learning materials and experiences. **Considering all these factors this position paper will dwell upon the following modes of Publications**

- **Text Books (Conventional)**
 1. **Normal Children**
 2. **Blind children**
- **Digital publications**
- **Learning materials on the lines of Montessori methods.**

2. TEXT BOOKS (CONVENTIONAL)

2.1 Importance

A **textbook** is a book containing a comprehensive compilation of content in a branch of study with the intention of explaining it. Textbooks are produced to meet the needs of educators, usually at educational institutions.

Though the textbooks are not the only learning and teaching resources, they still play an important role in student learning. Textbooks are not only teaching materials for teachers, but also students' self-directed learning materials for preparation and revision purposes. Being important sources of reading for students, quality textbooks help develop students' ability to learn through reading. The amount and quality of the texts to be included therefore deserve greater attention. In other words, Quality textbooks tell, involve and interact with students.

Bureau of Indian Standards have also prescribed and brought out manuals about the different Standards that can be adopted for the production of Text Books. The different Manuals brought out for the Printing Industry are shown in **Annexure-1**. These Standards have been formulated after sufficient research over the subject by the Committees formed by the said Institution. However, many of the guidelines suggested therein are outdated due to technological changes. Therefore, quality parameters in this paper have been formulated based on the standards fixed and the present technology and needs.

In the National Education Policy, the new Pedagogical and Curricular Structure has been classified in to 4 stages (5+3+3+4) as follows:

1. Foundational stage for 5 years, covering Anganawadi, Pre-school (Lower Kinder Garten and Upper Kinder Garten) and class 1 and 2
2. Preparatory stage for 3 years, covering classes 3 to 5
3. Middle stage covering 3 years for classes 6 to 8
4. Secondary stage covering 4 years for classes 9 to 12

The Early Childhood Care and Education which forms the foundation of learning is also given importance. Here the teaching will be play-based and certainly require a different structure for the text books. Also, during this period learning should be through materials and with practical orientations. Therefore, along with the reading materials it is essential to include learning materials also in this stage. The age group in this stage is 3 to 8 years. Obviously, the specifications both textual and non textual will have to be different from other stages of learning.

2.2 Present System of Text Book Production and Distribution

Presently the production and distribution of the Text Books and other learning materials has been entrusted to the Karnataka Text Book Society. A major portion of the text books are being entrusted to private printers and a small portion is being executed at Government Presses.

Karnataka Text Book Society

Karnataka Text Book Society ® came into existence on 01.04.2006 in accordance with the provisions of the Government order No. ED 95 DGO 2005, Bangalore Dated 04/01/2006,

promulgated to form autonomous body with the main responsibility of production and distribution of all school text books. Presently it is executing the following works

- Preparation, Translation, Revision and Editing of textbooks
(Class 1 to 10 comprising of around 560 titles).
- Printing and supply of textbooks (class 1 to 10) under free and sale category
- Printing and supply of Learning materials for class 1 to 3 (Nalikali)
- Printing and supply of learning materials for pre-primary classes for 908 selected Govt. schools from the Academic year 2022-23.
- Printing and supply of work books for Govt. schools (class 4 to 9 Kannada medium students)
- Printing and Supply of textbooks for 74 Adarsha Vidyalayas (class 6 to 10)
- Preparation of Bilingual textbooks (English and Mother tongue) for children of class 1 to 5, studying in English medium sections of Govt. Kannada and Urdu medium schools.
- Printing and supply of Sociology, Political Science and Economics textbooks for Children With Special Needs –CWSN, studying in class 8 to 10 (instead of Mathematics and Science)
- Printing and supply of Student diaries for class 1 to 12. (Govt. schools)
- Preparation, revision, Printing and supply of textbooks for Fine Arts (Music, Instrumental, Dance), Drawing, Yakshagana and Vocational education handbooks for teachers etc.
- Printing and supply of textbooks for children studying in Madarasas.
- Printing and selling of PUC textbooks.
- Printing and supply of NSQF textbooks (National Skills Qualification Frame work) for class 9 to 12. (only for selected Govt PU colleges)

The sequence of operations done by the KTBS in the procurement process are as follows

- 1) Collection of indents directly from the schools with the verification made by CRO, BEO, DDPI
- 2) Scrutiny of the indents so received and getting the corrections if any
- 3) Categorising the titles in to different packages
- 4) Getting the estimates from the Director of Printing and Stationery.

- 5) After scrutiny seeking the approval of the Finance Department through Education Department.
- 6) Placing the subject to EC and GC seeking the approval to float the tender.
- 7) Issuing work orders to DPS to print and supply the books to their capacity.
- 8) After the approval from GC inviting the tenders from the eligible printers.
- 9) Conducting the pre-bid meeting and incorporating any amendments within the ambit of rules
- 10) Opening of the tenders and conducting scrutiny of the documents.
- 11) Opening of the technical bids
- 12) Technical Evaluation by a designated Committee which includes document verification and then infrastructure verification
- 13) Opening of financial bids of the technically qualified tenderers
- 14) Financial evaluation to arrive at L-1 rates
- 15) Issue of Order of acceptance to successful tenderers
- 16) Obtaining the acceptance, Performance security and agreements from the successful tenderers
- 17) Issue of the work orders
- 18) Quality control measures
- 19) After confirming the deliveries at BEO offices and getting appropriate certifications making payments to the tenderers

Considering the numerous steps involved the process of procurement should start from a date working backwards. The Books are required to be delivered to the schools by second week of May every year. At least 6 months production period should be given to the printers which will have sufficient time to procure the raw materials and to monitor the quality in the production. This will also reduce the cost of procurement as the printers need not draft overtime to complete the production well-in-time. A procurement schedule is shown in **Annexure-2**. Accordingly, the procurement process shall commence by June of the previous year to completed the deliveries by May second week of the next year.

The KTBS is also entrusted with the production and sale of the PUC text books. There is no free supply scheme for the PUC text books. They are sold in the open market at the prices fixed by KTBS. But for the change in method of distribution the method of procurement is same as that of School Text Books. The prices are fixed as per the procedure shown in **Annexure-5**.

One of the major issues here is the possibility of pirated books in the market. It was reported in 2020 that about 10.0 lakh pirated NCERT Books were seized in Meerut. The value of these books was estimated at more than 7 crores. The possibility of piracy in PUC books also

cannot be ruled out. The piracy in PUC text books may drive the stocks to be left out at KTBS and gradually this may become a serious issue and may land up the KTBS in to a big loss. This issue requires to be addressed immediately.

2.3 Challenges faced in timely procurement

The timely delivery of the school text books to all schools is an essential requirement to ensure that the learning and teaching starts on time. In some of the previous years this has not happened and articles on delay of text books has always been a regular feature in the newspapers. The following are the factors said to be cause for the delay in the delivery of text books.

a) Delay in receipt and consolidation of the indents

Though the situation has improved quite a lot after the process of getting the indents through SATS portal has been implemented. But still delay in finalization of the indents is not ruled out. Presently the indents are prepared and submitted by the School Head Masters and will be scrutinized by Cluster Heads, BEO's and finally will be approved by DDPI's. Later these indents will be verified at KTBS level. The errors in portal is majorly seen in the language books. This can be avoided if appropriate filters are facilitated in the portal whereby making entries in the portal, will become more accurate.

Also it is essential to ensure that indents are received from the un-aided schools in time.

b) Delay in the approval to call for the tenders

The very purpose of formation of the Society is to reduce levels of decision making and speedy approvals. The procedural delays taking place in Government at different levels require to be looked into.

c) Delay in evaluation of tenders

After opening of the tenders the evaluation has to be done in accordance with KTPP Act and Rules, which is a meticulous process. The inspection of the tenderers facilities is also a time consuming process. During evaluation many a times the rates quoted by the printers shall be much higher than the estimates prepared by the KTBS. There are no schedule of rates for the preparation of estimates. The paper rates considered for the purpose of estimates is also not scientific. Because of which the estimates prepared by DPS will not be scientific and consistent.

This aspect can be set right by

- Devising a mechanism where the paper will be procured by KTBS and the same will be allocated to the printers to whom the printing contract is awarded.
- Formulating the Schedule of rates and calling the tenders only for the cost of printing based on the schedule of rates.

d) Lack of alternative infrastructure with the printers.

Most of the printers own a single line of production facility and therefore the delay becomes inevitable if there is any mechanical breakdown.

Reluctance on the part of the private printers for the upgradation of their infrastructure.

There should be regular upgradation of the machinery in any kind of the production plant which is not happening in the private printers.

e) The infrastructure in the Govt Presses is not utilized to their full capacity

The infrastructure available in Govt Presses is not being utilized to their full capacity. The Govt presses at Mysuru and Kalburgi have been exclusively designed for the text book production. They have a capacity to print atleast about 40 lakh text books in 3 months period. During 2019-20 academic year they had printed about 40lakhs of text books while it is hardly 7 lakhs during 2020-21 and nil in 2021-22. These presses require to be maintained atleast for the sake of retaining technology within the Government

It is said that Certain administrative and technical reasons have created this situation which requires to be addressed.

f) Short supply or non supply of paper and boards

The closure of Mysore Paper Mills a state owned Company and non supply of economy maplitho by West Coast Paper Mills, a local producer of paper located in Dandeli has made the printers to depend on the Mills outside the State. Most of the other state Governments have a system of procuring the paper themselves and supplying the same to the printers. The printers have to execute only the Printing work by engaging their infrastructure. In such cases the investment on paper by the Printers is avoided and therefore more number of printers will be available to execute the work.

The Paper Mills will have a commitment to the other State Governments due to their earlier agreements and therefore the preference will be given to them rather than private printers who have taken up the text books of Karnataka.

During many previous years the Tamil Nādu Newsprints and Papers Limited (TNPL) and Seshasayi Paper and Boards (SPB) who are located in Tamil Nādu and who supply the maximum quantity of paper to our private printers had to shut down their mills due to shortage of water in the rivers. This happens whenever the rains fail in the catchment area. Where as the West Coast paper Mills Limited has never faced the problem of water shortage.

During pandemic the Art Board required for cover making was not available due to fall in imports.

(h) Improper indents from the schools.

This is an issue more particularly from the unaided schools to whom the books are being supplied on payment basis.

The indents from the unaided schools many a times will not be as per their requirements. They become too cautious to indent as minimum as possible and whereby the KTBS will not be in a position to assess the exact print order and therefore a repeat order has become a regular feature

2.4 Quality Parameters for Textual materials

The design of the content becomes the feature of Textual material which include – Page layout, Illustrations, Print area, Margins, Font size, Spacing, Graphics, No of Colours. For these parameters the Bureau of Indian Standards has given guidelines in their Paper IS 7160:2003. However, these standards are more connected to conventional type setting methods. Taking this as basis the committee has recommended the standards to suit the present technology and NEP in **Annexure-3**. The Print Area, margins, Type sizes etc. vary from stage to stage and class to class.

- The **Page layout** shall be logical and consistent. The materials shall be well-organised, with appropriate use of space and margin for ease of reading, but avoiding unnecessary use of blank space.
- **Illustrations** such as photographs, pictures and graphs shall be accurate, appropriate, effective and suitably annotated to stimulate and facilitate learning. They serve to direct students to the instructional focus rather than distract them from it. A number of factors come into play to make the graphics useful for learning. Specifically,
 - The graphics are relevant to the text. Photographs and illustrations are not just added to lighten up the presentation. Their reference to the text is obvious, either through direct cueing or proximity to the relevant text segment;
 - the sequencing of the graphics is appropriate to show a developmental process; and
 - an appropriate balance is struck between text and graphics.
- The **print area and margins** depend on the size of the book and in turn the size of the book varies from stage to stage.
- The **font type** is one of the important criteria. To avoid confusion, the font type and font size shall be consistent throughout the textbooks. In order to avoid eye strain and for more comfort of reading, larger size fonts are recommended, for lower levels while smaller font sizes for the higher classes.
- The **spacing between lines**, between paras, Chapter headings, sub headings etc are also need to be given due importance. These parameters again related to the font size, font type etc. Different font types and sizes are to be used for different stages of education.
- **Number of columns** of Text has to be decided based on the size of the book and the font size.

- The **Colours** in the letters is recommended to be not more than two for the ease of proper registration in the high speed web offset machines.
- The **Pictures** shall be avoided with the dark backgrounds to prevent the see through on the other side of the page.

2.5 Quality parameters Non-Textual

The issues covered under non-textual material are

- The size of the Book
- Paper to be used for text which comprise- Type of Paper, Thickness of the paper, type of pulp, Formation of Pulp, Brightness, smoothness, opacity, Tensile Index, Cobb, Wax pick, Bending stiffness, Gloss, Coating etc.
- Board to be used for the Cover
- Method of Printing
- Method of Binding
- Method of packing
- Security codes to be adopted

The specifications of Non-Textual parameters are provided in Annexure - 4

2.5.1 Size of the Book again has to be decided based on the student age and the design of the book. For stage 1 and 2 it is recommended to use bigger size books (A-4 i.e. 210x297 mm or 210x280 mm) and for stage 3 medium size books (Crown 1/4th- 183x245 mm) while for stage 4 it is advisable to use medium size (Crown 1/4th- 183x245 mm) and also small size books (A-5 140 x210 mm or 140 x 207 mm). Two options have been given for A-4 and A-5 with due consideration of the technical specifications of the machinery available in the market.

2.5.2 Paper to be Used

- **Type of Paper:** Generally, Maplitho is the best opted paper for the printing of Text Books. But writing on maplitho paper with ink pen is difficult. Therefore, wherever the books are hybrid i.e. both text book and a work book it is advisable to use the pencils or the ball point pens to write. Different mills have brought out their product with different brand names.
- **Type of Pulp** is one of the important parameters which define the quality of the paper and also the consistency of the quality. The pulp is being manufactured by using Wood, Bamboo, Bagasse, wheat Grass etc. Though there are different types of pulp they are broadly classified as Virgin Pulp and Recycled Pulp. Virgin Pulp means pulp extracted freshly from the above said materials instead of being procured from recycled sources. The pulp extracted from waste paper is

called recycled pulp. For the obvious reasons for text books printing, it is advised to use paper made out of atleast 80% Virgin Pulp.

- **Formation** is an indicator of how uniformly the fibers and fillers are distributed in the sheet. Formation plays an important role as most of the paper properties depend on it. A paper is as strong as its weakest point. A poorly formed sheet will have weaker and thinner or thick spots. These will affect properties like caliper, opacity, strength etc. Paper formation also affects the coating capabilities and printing characteristics of the paper. A poorly formed sheet will exhibit more dot gain and a mottled appearance when printed.
- **Thickness of Paper** is measured in terms of Grams per square meter of the paper/Board. This is to be considered based on the age of the student, handling, kind of content whether it is with halftone graphics or line diagrams, number of colours etc. The books for stage 1 and 2 are to use 80 to 100 gsm while for all other books 70 gsm will be sufficient. For language books for higher classes where it is more of text rather than graphics 60 gsm paper should be sufficient.
- **Brightness** is a parameter that influences the depth of printing. Higher the brightness better will the graphics look.
- **Smoothness** is concerned with the surface contour of paper. It is the flatness of the surface under testing conditions which considers roughness, levelness, and compressibility. In most of the applications of paper, the character of the surface is of great importance. It is common to say that paper has a "smooth" or a "rough" texture. The terms "finish" and "pattern" are frequently used in describing the contour or appearance of paper surfaces. Smoothness is important for Printing where it has an impact on the clarity of the Graphics both in multi colour and single colour. Higher the smoothness up to certain level is considered as a better paper.
- **Opacity** is the measure of how much light is kept away from passing through a sheet. A perfectly opaque paper is the one that is absolutely impervious to the passage of all visible light. It is the ratio of diffused reflectance and the reflectance of single sheet backed by a black body. Opacity is important in Printing Papers, Book Papers, etc. The opacity of paper is influenced by thickness, amount and kind of filler, degree of bleaching and coating etc.
- **Tensile Strength** is an indication of the strength of the paper. Tensile strength can also be used as an indication of the potential resistance to web breaking of papers such as printing papers during printing on a web fed press. Higher the tensile strength better is the paper.
- **Cobb** is the indication of water absorptive nature of the paper. Lesser cobb value is better for the ease of printing and to retain the dimensional stability of the paper.
- **Wax pick** is the surface bonding strength of paper which is a measure of its resistance to separation of coating or fibers or to any cleavage parallel to the sheet surfaces. Paper is said to "pick" when coating, fibers, or small portions of the paper itself separate from the body of the sheet while it is being printed. This tendency for picking is of great concern to printers and it is

necessary to control pick strength in making most types of paper. Higher wax pick is expected in the printing papers as well as boards

- **Bending stiffness** is the degree to which paper or board resists bending when subjected to a bending force in its intended use.
- **Tearing resistance** indicates the behaviour of paper in various end use situations; such as evaluating web runnability.

2.5.3 Cover Material

Two types of materials are generally used for the covers of the text books- one is both side coated **Art Boards** or both side/one side coated **pulp boards**

- **Gloss** is the measure of specularly and diffusely reflected light component against a known standard. Gloss is important for the cover printing and varnishing. The level of gloss desired is very dependent on the end use of the paper. Gloss and smoothness are different properties and are not dependent on each other.
- **Coating more precisely UV coating** is an important feature required in the Boards to be used for the Book Covers. Earlier the Book Covers were laminated. But as a measure to make it more eco-friendly and to discourage the use of plastic it was changed to UV coating. The UV coating provides strength to the cover and also makes it water resistant and scratch resistant.
- **Folding Endurance** is the paper's capability of withstanding multiple folds before it breaks. Folding endurance has been useful in measuring the deterioration of paper upon aging. It is important for printing grades where the paper is subjected to multiple folds like in books, maps, or pamphlets. Long and flexible fibers provide high folding endurance.

The specifications for both Art Boards and Pulp Boards are provided in **Annexure-4**

2.5.4 Inks

The percentage of cost of inks in text books printing is 2% to 5%.

Covering power, transferring propensity, absorption, drying time, viscosity, striking through, Tack and strength are the important characteristics of inks. The BIS has given specifications for the inks in the publication IS: 6830-1973 and also provided guidelines for the testing in the publication IS: 6931-1972. Due to low cost component the ink is imparting and also the printer himself has to be cautious of the quality of the ink keeping in mind the safety of the machine, cleaning time, wastage in paper etc. the quality parameters are not given much emphasis here. Though the testing of the paper is got done in a laboratory as a part of technical evaluation the testing of inks is not generally done for the obvious reasons. There are many brands of inks available in the market and the printers can choose the one that best suits their machinery. There are some printers who manufacture the inks by themselves also. Ultimately the printer has to choose the right ink that suits their machine and the substrate used.

2.5.5 Glue

Though section sewing and pasting the cover with synthetic adhesive is the right method of binding for the reasons of speed and economizing the cost of production now a days hot melt adhesives are being used. In recent days a chemical called Poly Urethane Reactive adhesive generally called as PUR is also being used. Though it is costlier it gives very good bonding between the pages and the cover. The quality of the adhesive is reflected in the final quality of the binding. There are hardly 2 or three brands of such adhesive. The cost of adhesive for each book varies between 40 paise to 50 paise. Apart from the good quality adhesive it is very important that right temperature, right speed is used to have effective binding of the book.

2.5.6 Method of Printing

Different methods are adopted for different products. For the printing of text books Offset method is adopted and Web offset and Sheet fed offset machines are used. The quality of the printing directly depends on the machine quality, age of the machine etc. Though the recent machines are computerized and the human skill requirements are minimized we cannot rule out the requirement of human skills in setting up the machine and controlling the quality.

2.5.7 Method of Binding

Different methods of binding have to be adopted for different works depending on their usage methods. For text books (i) center pinning, (ii) Section sewing with perfect binding and (iii) Side pinning with perfect binding methods is adopted.

2.5.8 Method of Packing

Proper packing is very much essential to ensure that the book reaches the ultimate user in this case the student in good shape without any damages.

2.5.9 Security Codes to be adopted

Providing security codes may not be required for the school text books which are supplied directly to the schools through the BEOs either free of cost or for sale. However, making the PUC text books with security features is very much essential for the reasons already explained in the earlier paras.

2.6 Quality Control

a) Objectives of Quality Control

- ◆ To reduce variation in the printed material
- ◆ To provide Quality Assurance in aesthetic aspects.
- ◆ To ensure that the specified materials only have been used
- ◆ To ensure dimensional conformity to the specifications

- ◆ To avoid rework
- ◆ To reduce wastage
- ◆ Improve efficiency whereby increase the production

b) **Functions of Quality Control**

To specify the levels of excellence to be achieved in production as per customers requirements in relation to statutory standards, Cost-time limitations and Plant capabilities and devise and lay down the methods to control all the activities to reach the objectives.

c) **Factors that influence the Quality**

The important factors that influence and contribute for the quality of the final finished book are -

- ◆ Time available for production
- ◆ Raw Materials used
- ◆ Design & Art work
- ◆ Plant & Machinery adopted
- ◆ Man power employed
- ◆ Packing, Forwarding and Handling

◆ **Time Available for production**

The production should be planned well in advance to enable the printers to procure the raw materials of correct specifications, to allow the paper for seasoning etc.

This requires to be controlled by the top management constituted by the Executive committee, Secretary to Government, Education Department and the education minister.

The master schedule for all the processes involved has been drafted on the principle of working backwards and shown in **Annexure –2**.

Adhering to this time schedule will enable us to give due attention to every operation. Also, the work groups can work under stress free environment, whereby the overall quality of the work turned out will be of higher standards.

◆ **Design & Art work**

Operations ranging right from preparation of manuscript and artwork to printing and binding do affect quality in printing. Copy preparation and typographic designing are the basic needs and their importance do not require any further emphasis.

In the design of a textbook the specifications of the Types, halftone screens, Layout etc. shall be based on aesthetic, economic and functional considerations. The specification pertaining to the Design & Layout of different textbooks are given in IS7160: 2003.

◆ **Raw Materials:**

It is a known fact that the quality of the end product in printing depends on the raw materials used, as is the case in any production activity. In the production of Text Books 80% of the cost of the total production goes for the Raw Materials. Because of the high value involved in this component there will also be a temptation for the executors to compromise and use substandard materials.

Therefore, the Quality Control begins with the procurement of raw materials of the right quality, its storage and preservation before it is put to use.

A judicious decision should be taken while fixing the specifications and then to control and ensure that the materials of correct specifications only have been used. The specifications shall be based on the Standards fixed by the Controlling Authorities like Bureau of Indian Standards, available Funds, Consumer expectations, etc.

The main raw materials that are used for the production of the Text Books are –

Paper for Text

Paper for Cover

Inks

Binding Glue

Binding wire

After finalisation of the Paper Specifications the Ink Formulations shall have to be fixed by the manufacturers of Printing Inks to suit the specified paper qualities.

The specifications stipulated for the paper to be used for the production of Text Books, are shown in **Annexure-4**. Another important raw material i.e. ink requires to be of correct formulation to result in good contrast and glow in the print. Ink of poor quality may show up the defects like picking of the paper, blurred and spreaded dots, smudginess, mottling, set off, see through etc. in the printed material.

Other raw materials like the binding glue, stitching wire shall also be of good quality. The text books are generally prescribed to be bound by a method called "Perfect Binding" by using hot melt synthetic adhesive when total number of pages in the book are more than 128. Here the books are first side stitched with galvanized steel wire or section sewn with thread for the proper bonding of the book pages. Wherever the no. of pages is equal to or less than 128, the books require to be bound by centre pinning using good quality galvanised steel wire or good quality thread.

◆ **Plant and Machinery.**

Once the right kind of raw materials are selected then the focus will be on the Plant and Machinery. It is equally important to have a plant which is spacious enough for the volume of work handled and maintained clean and tidy. It is also needless to mention that the place is free from white ants, Cockroaches and such other pests. The atmosphere of storage place requires to be maintained with right levels of humidity, temperature, ventilation etc.

The machinery should be of modern technology and should be in fit condition to produce the print of good Contrast, Glow, Registration etc. The printing should be wrinkle free and should not result in set off.

◆ **Man power Employed**

Earlier printing & binding were considered to be more of a kraft work than a technical process. Though the situation has changed a lot still the importance of manpower has not reduced since the present days sophisticated equipment require the Man Power with high levels of skill and training to handle them.

Therefore, it becomes necessary to prescribe certain level of qualifications and experience for the staff at different levels.

◆ **Packing, Forwarding and Handling**

There are many instances where due care is taken only till the production is completed and the Packing, Forwarding & Handling are totally neglected. This aspect is also equally important and modern methods are to be adopted in the transit of the goods till the books are delivered to the students. Undoubtedly it will add to the cost but definitely it will reduce the wastage and builds up the reputation of the system & is advantageous in the long run.

d) Existing Methods of Quality Control

The following paras will explain the different methods being adopted to control the quality levels. First step to implement effective Q.C. system is to have an organised team of people answerable to top management to determine and maintain quality standards and improve on them.

Following are the existing 4 levels of quality control being executed

- **1st Level**

Wherein the paper procured by the printers shall be inspected by the Departmental Officials and will be certified before it goes for production

- **2nd Level**

Here inspection would be conducted while the production being taken place

- **3rd Level**

The inspection of the text books against the quality parameters prescribed before they are despatched.

- **4th Level**

The books are inspected at the receiving point i.e. post delivery inspection

Challenges faced in the maintaining of the Quality Control

➤ **Effective Quality is a difficult task.**

The text books are a commodity and the numbers are huge. Checking of each and every book is not practical and not cost effective. Therefore, random sampling technique is being used. The checking is done before the dispatches in the ware houses of the printers which will not provide a good check on quality for the obvious reasons. The checking of paper before start of the production is being implemented recently and due to paucity of time and lack of cooperation from the printers it is not being done effectively. The post delivery inspection is not being done effectively as there will be shortage of time and the books would have been delivered just in time or many a times after the schools are opened.

➤ **Paper Quality**

The first and foremost deviation found is in the paper quality. Since the tenders are called inclusive of all the raw materials, the successful tenderers themselves have to procure the paper. In the printing about 70% to 80% of the cost is of paper. There will be a tendency on the part of the printers to use paper other than the prescribed one to cut the cost of production. The cost of the B grade paper is much lesser than the A grade paper which is generally specified in the tender. The reasons are many. One of the reasons is to make higher profits. The other reason is the variation in the paper rates. Many a times there will be an increase in the paper rates from the date of notification of tender and the actual time of production.

➤ **Paper Size**

Instead of using the paper of prescribed width there will be a tendency to use lesser width and lesser cut off. For example instead of using 76 cms reel width there were instances that the printers were using 75 cms width reels. This would result in lesser size of the books.

➤ Neither the KTBS most of the printers have not adopted online quality inspection laboratory nor the Department of Printing, Stationery and Publications (DPS) have a full-fledged laboratory to test the quality of the books.

➤ **Technical Staff**

Shortage of technical staff in the KTBS. They have to depend most of the times on the DPS.

➤ **Quality Inspection**

Quality inspection has been done by the same officials year after year and the printers are also the same bunch. The packages may change but the same group of printers would be getting the order.

3. TEXT BOOKS FOR BLIND

A braille book printing press owned by Karnataka Government has been working from 1982, and catering to the needs of the blind students of 4 Govt Schools and 25 Private Aided Schools. The press is located in Mysore and is under the administrative control of Women and Child welfare department. They are printing about 15,000 books every year and are being distributed free of cost. They are also printing other than text books and are being sold to blind students at a subsidized rate of 1/3 the cost of production.

The braille books have to be printed by embossing the letters and the binding is also different to make it convenient for the students to go through the books. The paper used is 165 gsm as the letters are in embossed form. The functioning of the press is quite satisfactory and is efficiently managing the needs and the existing system may be continued.

4. DIGITAL PUBLICATIONS

Using electronic learning resources to enhance interactive and self-directed learning has become a global trend in education. The interactive and diversified sets of digital publications developed in line with our local curricula are an alternative to printed textbooks. Schools may select to adopt digital publications according to their students' learning needs and capacity, as well as the school infrastructure and technical support.

For several reasons, including the commercial and infrastructural, digital textbooks will not replace printed textbooks but will extend and complement the printed editions.

Importance of digital publication of text books

a. Study Anywhere and Anytime:

An eBook is easy to carry around and lots of information can be carried in a small device like a smart phone, Tab, Laptop etc. It is needless say how advantageous to carry a small device rather than carrying bag full of books. **Offline Access to eBooks:**

In the context of technology advancement even the small equipments like smart phones are embedded with huge memory which makes it easier to download the e-books for offline study also. Though internet connectivity is no more a rare facility the students can also make use of the offline possibility also.

c. Multiple Interactive Features:

eBooks are not just plain reading materials; they have all the right tools to help students make notes and highlight content. eBook reading devices have a lot of interactive features, like annotations, pen tools, page zoom, search option, read aloud etc. The search tool is the most favoured tool because of its ability to find words and topics in an instant.

The search tool avoids the time-consuming process of turning pages after pages to find a particular topic or phrase. They can bookmark pages and chapters. The online dictionary helps them to quickly find meanings of words. Besides, the user can also change the font size and style and adjust the brightness of the device as per what suits their eyes. An eBook is an all-in-one device which provides a wholesome learning experience to students.

d. Edutainment Value:

The course content doesn't have to be only text. You can include music, animations, videos and audio explanations into the learning module. Videos make the learning process more interesting. Students can pause and rewind the video and watch it again. Animations are fun and entertaining and have more retention value.

Watching video content aids in retaining information far better than reading the same stuff. Many publishers are now incorporating videos into their eBooks to keep the students engaged in the course material. Videos and animations add an entertainment value while being informative at the same time. It helps improve their ability to learn and recollect information.

e. Experiment with Augmented Reality:

Augmented Reality is transforming the learning space at an incremental pace. Bringing AR into eBooks provides an immersive learning experience to the students. AR can transform any normal image into an enhanced 3D image, which the students can view from all angles.

They just need to point their AR app-enabled device at the image or object, and a computer-generated visual pop up on their screen. This 3D image helps provide students with an immersive and compelling learning experience. Students would find these enhanced visuals more interesting over flat diagrams. It can also have links to relevant external sites, where they can find more information about the projected image.

f. Save Printing Costs:

eBooks do not require paper and printing in to a hardcopy. This will result in huge cost reduction. No Paper, No chemicals and no transportation means not only cost reduction but also nil effects on the environment. The paper requires huge quantities of wood, Paper mills consume huge quantities of water and release lot of chemicals in to rivers. From the available sources it is estimated that we require 24 trees of 12mtrs height and 15-20cms diameter along with about 95000 litres (95 kilo

litre) of water to produce one metric tonne of paper. The paper required to produce text books every year is about 18,000 metric tonnes which means we consume 4,32,000 trees and 17,10,000 kilo litres of water every year. This kind of assault on the environment can be reduced if we encourage using e books in a bigger way.

g. Provide Updated Content to Students:

In traditional paperback books, if there's some updated information that needs to be included in the syllabus, you'd probably have to reprint new books. But with eBooks, all the learning material is stored on the cloud.

This means, eBooks can be updated anytime you want, and it will be reflected in all eBooks. So, you can always ensure that your students have up-to-date information with them at all times. This again saves your reprinting costs.

h. Interactive Assessments:

e-Books include self-assessments for students to test their knowledge. It does away with the traditional style of giving a quiz at the end of the chapter. eBooks are embedded with quizzes and exercises throughout the chapter and also after the chapter ends, to ensure that students retain the information that they are reading.

It helps measure whether the student has understood the concepts properly. eBook assessments can provide instant results, so students can immediately view the test results. Not just students, the teacher can also view test results and provide immediate feedback.

The introduction of eBooks in education has optimized the learning experience. It has turned learning into a fun and engaging event. Students no longer dread having to carry a load of books and sit through hours of lectures paying only half attention to what is being taught.

e-Books ensure that students are proactively interacting with the learning material by way of videos, animations, augmented reality, changing displays, taking notes etc. Digital books provide students with a completely enriched learning experience and help them improve their academic performance

The following features are generally available in the e-books:

- i. The page width shall be adjustable to the width of the reading tool like Mobile, Lap top, Tab, Kindle etc
- ii. The turning of the page should be simple and shall be akin to turning a page of a conventional text book
- iii. Book mark facility shall be enabled
- iv. Search facility shall be enabled

- v. Compact in size of the file
- vi. Highlighting facility shall be enabled

5. LEARNING MATERIALS ON THE LINES OF MONTESSORI METHODS

The Montessori Method is characterized by a practical approach and here each student will be treated and taught differently. This provides a prepared environment. Here the teaching methods are simple and with the aid of tools rather than books. Each element exists for a reason in order to help in the development of the child. A Montessori classroom also integrates children of mixed ages which promotes socialization, respect and solidarity among them naturally.

Children here work with concrete materials that were scientifically designed, which provide them the keys to explore the world and develop basic cognitive abilities. The materials are designed to allow the child to recognize the error by him/herself and become responsible for his/her own learning.

As the concept itself is learning through materials the publications or the books get lesser significance here.

The Montessori methods are best suited for the children at younger ages. As the child grows the hybrid methods that is both Montessori and Conventional methods may be adopted. From this academic year even in Government Schools Lower Kinder Garden and Upper Kinder Garden classes are being introduced. Therefore, a serious thought has to be given as to what method to be adopted at LKG and UKG.

6. RECOMMENDATIONS

After going through the existing system, the present day's needs, Challenges faced, the following recommendations have been made to ensure the quality publication of text books within the time frame.

1) The entire responsibility of publications has been entrusted to KTBS. A strong and fully equipped organization only can deliver the goods as required. Though the KTBS was formed about 16 years back no amendments have been made to the byelaws. Still there are no Manual or Standard Operating procedures or even a Cadre and a Recruitment rule (C & R). It is strongly recommended to prepare a comprehensive Departmental Manual including the Accounting Manual and C & R.

2) The tender inviting procedure has to be streamlined still further.

There is inordinate delay in providing the approvals which requires to be set right. The process of getting the approvals requires a time bound responsibility at different levels.

There should be a set time table for the tender calling, tender evaluation and production time. The time table provided in the Annexure-2 has to be followed.

3) Tendering procedure should be such that a healthy competition is created and the procurement will be attained at an economical price. And this will help to achieve better quality product. A higher price will make us compromise on the quality to procure the goods within the

available budget. Therefore, no policy should be adopted which will cut the competition and increase the rates.

4) The sizes and gsm of paper require to be changed as per international standards. It may have to be different for different stages of education keeping in view the age group of the students.

5) The recommended specifications as per Annexure 3 and 4 may be followed

6) The estimates have to be made in a more scientific way to ensure the tender rates are practical and realistic. Presently there are no set guidelines for making the estimates. There is no schedule of rates. The estimates making shall have to be more specific and well supported. Otherwise, we may land up in impractical estimates. Sometimes they may be over and above the possible rates while sometimes it may be much lesser also. Therefore, schedule of rates to prepare the estimates have to be made by an expert committee and all the estimates shall have to be based on this schedule of rates.

7) Allowing printers to procure the paper at their level may lead to procurement of undersized, under grammage or inferior quality paper. In most of the other states the paper is procured by the Government and supplied to the printers and the rates are invited only for the production activity based on the schedule of rates. The paper required has to be procured and supplied by the KTBS instead of allowing the printers to procure the paper. The tenders shall be called only for printing cost. A mechanism has to be developed for the same. In MSIL a state-owned company the paper has always been supplied by the company to produce Vidya and Lekhak Note books.

8) The infrastructure existing in Government presses has to be utilized at its optimum level. It has already mentioned in the earlier paras that the infrastructure of Government presses has totally been neglected. A PPP model of production facility may also be established to ensure the highest quality parameters. This will ensure the freedom of text book production from the clutches of private printer's lobby. Most of the state governments have their own production facilities to augment the private resources. More particularly the PUC text books which will add more value should be executed under government control.

9) The quality control measures require to be more stringent. The post delivery inspection should be made compulsory. If the Paper is procured by KTBS much of the quality control is done. The post delivery process being practiced now is not foolproof and sufficient. The actual checking has to be done in the godowns culling out the samples from the lot. The quality inspection has to be executed by a third party and shall have a different team every year.

10) For the certification the sample books should be collected from the BEO office. Presently printers will provide the books which are specially made for the certification.

11) The stock taking in the Godowns should be made more accurate and proper documents like stock ledgers etc should be maintained. Present system is adhoc and not sufficient.

12) Implementation of the recirculation of text books for higher classes will reduce the production quantities and which will reduce the cost of production. A mechanism has to be developed to encourage the students to return the books at the end of the academic year.

13) Packing methods. Present packing methods require to be relooked. If the strapping is continued edge protectors may be introduced. Or the books may be packed in corrugated boxes as is done for PUC books.

14) Availability of the books throughout the year. Presently it is like a controlled product. If a student loses a book, it is almost impossible for him to get another book. The books atleast in small quantities should be available in Government Book Depots. Also, all the text books should be kept in all public libraries so that the students will have access to the text books.

15) Though the misuse of text books for lower classes may not happen as most of them are supplied free of cost. However, the possibility of pirated books cannot be ruled out as far as PUC text books are concerned. Therefore, a security mark has to be provided to all PUC books like a security label, printing and supplying covers separately from a different source, embossing a seal on each and every book before they are released to the market. The cost of such exercise may be hardly about 50 paise per book. But in the long run it will fetch huge returns to KTBS.

16) All the ware houses presently BEO offices may be supplied with few extra copies for sale and for quality verification anytime.

17) A Committee has to be formed to study the introduction of pre school classes in Government Schools and also the level of Montessori methods to be adopted. The Committee shall also provide design and specifications of the learning materials to be adopted.

18) More emphasis to be given to digital publications for the obvious reasons of flexibility, lesser cost etc.

1	M Ravishankar Retired Director of Printing, Stationery and Publications	Chair Person	
2	N. Lakshminarayana Director of Printing, Stationery and Publications	Member	
3	Dr. Basavarj M H Assistant Professor, JP College of Education, Gadag	Member	
4	Dr. Veeresh Hittalamani Principal, PPG College of Education, Gadag	Member	
5	Sri Shashikumar B S Asst. Master, GHS Yelekyathanahalli, Bengaluru- Rural	Member	
6	Smt Indira C.S. SADPI, DSERT, Bengaluru	Co-Ordinator	
7	Sri M. P. Made Gowda Managing Director, KTBS, Bengaluru	Nodal Officer	

Annexure -1: List of publications issued by BIS about printing, Paper and Text Book

Document Number	Standard Title	Status
IS 1345 : 1960	Methods of chemical analysis of printing metal	Active
IS 1357 : 1984	Printing type metal ingots	Active
IS 1380 : 1980	Ink, finger printing, black	Active
IS 1848 : 1991	Writing and printing paper	Active
IS 3680 : 1987	Round printing ink containers	Active
IS 4724 : 1968	Glossary of terms relating to printing inks and allied industries	Withdarwn
IS 5046 : 1994	Letter press ink, black, book printing	Active
IS 6931 : 1972	Methods of test for printing inks	Active
IS 10010 : 1981	Method for evaluation of strength and shade of pigment dispersion by printing method	Active
IS 10039 : 1981	Specification for Number Printing Machines, Hand-operated	Active
IS 10328 : 1982	Methods of expression of dimensions and direction of manufacture of unprocessed writing and printing paper	Active
IS 10380 : 1982	Methods of test for printing ink permeation of paper (castor oil test)	Active
IS 11087 : 1986	Paper for magnetic ink character recognition cheque printing	Active
IS 11097 : Part 1 : 1984	Glossary of terms for printing machinery: Part 1 Fundamental terms	Withdarwn
IS 11122 : Part 1 : 1985	Specification for Letterpress Printing Plates and Equipment - Part 1 : Original Printing Plates	Active
IS 11122 : Part 2 : 1984	Specification for Letterpress Printing Plates and Equipment - Part 2 : Flat Metal Duplicate Plates	Active
IS 11122 : Part 3 : 1984	Specification for Letter Press Printing Plates and Equipment - Part 3 : Galleys	Active
IS 11122 : Part 4 : 1984	Specification for Letterpress Printing Plates and Equipment - Part 4 : Jobbing Chases	Active
IS 11610 : 1986	Rubber rollers for offset printing	Active
IS 11635 : 1986	Method for determination of strength of disperse dyes for polyester by screen printing	Active

IS 12000 : Part 1 : 1987	Guide for paper spoilage and wastage for printing industry:Part 1 Sheetfed, letterpress and offset processes	Active
IS 12136 : 1987	Classification of printing machines	Active
IS 12530 : 1988	Silk screen printing inks	Withdarwn
IS 12619 : 1989	Printing industry - Safety code	Active
IS 12736 : 1989	Printing specifications for optical character recognition	Active
IS 12765 : 1989	Map printing paper	Active
IS 13906 : 1994	Graphic technology - Sheet fed printing machines - Range of sizes	Active
IS 14637 : 1999	Printing Machinery - Recommendations to be given on Indication Plates	Active
IS 14689 : 1999	Code of Practice for Fire Safety in Industrial Buildings (Printing and Publishing Industry)	Active
IS 15141 : 2002	Graphic Technology -- Blankets for Offset Printing	Active
IS 15306 : 2003	Printing and Publishing - Glossary of Terms	Active
IS 15495 : 2004	Printing Ink for Food Packaging - Code of Practice	Active
IS 15520 : 2004	Graphic Technology - Paints and Printing Inks - Assessment of Light Fastness Using Filtered Xenon Arc Light	Active
IS 15552 : 2004	Graphic Technology - Plates for Offset Printing - Dimensions	Active

Annexure-2: Schedule of activities for the procurement process:

Sl No	Particulars of the Event	Schedule Date of Completion
1	Finalisation of the Quantities	25th June
2	Approval of E C	30th June
3	Publication of Tender notification	1st May
4	Opening of Tenders	1st August
5	Work orders to printers	16th August
6	Indents on papers Mills	1st Sep
7	Commencement of Printing	20th Sep
8	Completion of Printing	31st March
9	Completion of Binding	10th April
10	Completion of despatches from All the printing presses	20th April
11	Receipt and Accounting of all books at all 32 godowns	30th April
12	Completion of distribution to Retailers	10th May

Annexure-3: Specifications for Textual quality parameters

Sl. No	Particulars of the Specifications	Stage-1 Foundational	Stage-2 Preparatory	Stage-3 Middle	Stage-4 Secondary
1	Size of the Book in mm	A-4 (210x297 mm)	A-4 (210x297 mm)	Crown ¼ th (184x245 mm)	Crown 1/4 th (184 x 245 mm) & A-5 148x210mm
2	Type Size	18 pt to 36 pt with 3 point spacing	14 pt to 24 pt with 3 point spacing	18 pt to 36 pt with 3 point spacing	12 pt to 14 pt with 3 point spacing
3	Print Area in mm	160x240 mm	152x228 mm	155x215 mm	155x215 mm
4	Interline spacing	It shall not be more than 6 points for text set up to 14 points and 9 point for text set above 14 point			
5	Inter para spacing	One blank line of the type size used shall be given between two paragraphs			
6	Sinkage of new Chapter	It shall not exceed six lines of the same point being used for text. A new chapter heading should begin from a fresh page.			
7	Space between Chapter Number and Chapter heading	One line of the same point size as used for the text			
8	Chapter Heading and Text	Up to 2 lines of the same point as used for the text			
9	Between text and folio heading	One line of the same point as used for the text			
10	Indentation	The first line of all paragraphs shall hav 12 point space and the first line of sub paragraphs shall have 18 point space.			
11	Running Heads	The type size for the running heads should be preferably be one size smaller than the text and not exceeding 18 points			
12	Illustrations	The illustrations shall be freshly drawn instead of downloaded from the websites. The half tone illustrations shall be high resolution and shall be compatible for the printing in 4 colours. Special colours and metallic colours shall be avoided. Wherever the text is also in colour the number of colours may be limited to 2 colours			
13	Font features	The font should be of Unicode shall be compatible for e publications.			

Annexure-4: Specifications for Non-Textual quality parameters

Sl. No	Specification	Details of Specification	Reference
<u>PAPER FOR THE TEXT PRINTING</u>			
1	GSM	80 gsm for stage 1 and stage 2 books and for other stages 70 GSM for 4 colour printing and 60 gsm for single colour printing	
2	Type of Paper	Maplitho	IS 1848 (part-1):2018
3	Tensile Index in Nm/g. CD-Cross Direction MD-Machine Direction	CD-20 MD-30	IS 1848 (part-1):2018
3	Brightness in Percent minimum	82%	IS 1848 (part-1):2018
	Opacity in percent minimum	85%	IS 1848 (part-1):2018
	Cobb max average	30	Previous experience
	Wax Pick minimum	10A	IS 1848 (part-1):2018
	Smoothness ml/min, maximum (Bendsten)	Side one - 200 Side two - 250	Previous experience
	Type of pulp	Atleast 80% virgin pulp	
<u>BOARD FOR THE COVER</u>			
1	Type of Board	One side coated Pulp Board or Both side coated Art Board	
2	GSM	190 to 220	
3	Bulk in cc/gm (minimum)	0.86	
4	Caliper in microns (minimum)	200	
5	Bending stiffness minimum	CD-11 MD-20	
6	Brightness	Top side-75 Inner side – 70	
7	Gloss pre print in % on top side	30(+/-)5%	
8	Gloss post print in % on top side	70(+/-)5%	
<u>OTHERS</u>			
1	Inks	Standard Colour Values conforming to ISO 2846-2.	

2	The printing plates	The technology to be adopted shall be transferring the image directly from the computer to Plate. Therefore industry standard Computer to Plates only shall be used	
3	UV Varnish	Shall be done with coating UV chemical and exposing to UV light. Shall be atleast 3 mm thickness and its gloss shall be atleast 70%	
	Printing Quality	<p>Printing shall be good, having uniform inking of sufficient depth.</p> <p>There shall be no aberration of colours, wherever colour printing is done. In other words colour registration shall be flawless. The texts shall be strong, legible and readable. The printed illustrations shall be clearly well defined. The prints shall be free from defects like offsetting, smudging, tilting, mis-register, scumming, slur, ragged print, light and dark shades etc., The text must have balanced margin in each page as per the design provided.</p>	
4	Binding Method	<p>Binding shall ensure good appearance, Proper Cutting, proper Cover adhesion, good Page strength, no Cavity in Spine, no Concave spine, no Adhesive running in, no Chip out at the head etc. The books up to 128 pages may be bound with center pinning.</p> <p>For the The books above 128 pages section sewing is the best method of binding. However, to bring down the cost of production perfect binding method may be adopted where in Hot melt adhesives or PUR may be used.</p>	
5	Packing	The books may be bundled with appropriate numbers depending on the number of pages. The weight of each bundle may be limited to about 20 kgs. The books may be packed in to corrugated boxes or may be bundled with strapping after using appropriate edge protectors	

Annexure-5: The pricing procedure for the PUC text Books

The Selling Price of the PUC text books shall include the following cost components

1. Actual cost of production

The cost of printing till it reaches the Godowns shall be included at actuals

2. Overhead costs

The overhead costs shall be the in the same percentage as that of the percentage value of the PUC text books in the total value of the works executed by KTBS. The components of overheads are salaries, Office expenses, Transportation and any other costs as and when decided by the management

3. Royalty to NCERT

Royalty paid to NCERT at actuals

4. Remuneration to Writers

The remuneration paid to writers, Poets etc. at actuals

5. Godown maintenance costs

Wherever the godowns are opened exclusively for the PUC text books, the total costs of such godowns at actuals shall be added. Wherever other text books are also stored, in such godowns the costs shall be added at percentage of the value of the PUC text books

6. DTP and Work shop costs

These expenses shall be added at the rate of 20% of the total cost every year as the revision generally takes place once in 5 years.

7. Inventory management costs

The time period from the date of taking in to stock and sales is estimated to be about 4 months. Therefore, the inventory management cost at 6% of the total cost of production is added. This amounts the interest @ 18% per year.

8. Writing off costs

It is charged at 10% of the total cost of production

9. Handling costs

It is charged at 5% of the total cost of production

10. Discount to be given to Books Sellers

The books are sold through the Government and Private book sellers and therefore to meet their cost of handling and to provide profit component 15% is being added on the total cost after adding all the above costs.

Annexure-6:**The specifications of the learning materials being introduced for preprimary Schools**

SI No.	Book no.s	Items	Size	No of pages/ Cards	Cover Page / Cards/ Charts	Inner page	Colour	Finishing
1	Book-1	Manual	A4	82 (78+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
2	Book-1	Story - Girl on the Wall	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
3	Book-1	Story - Story Poori Putti	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
4	Book-1	Story - Yaru Doddavaru	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
5	Book-1	Chart - Home Family and relationships	A3	1	170 GSM		4 colour	Gloss Lamination
6	Book-1	Family Chart	A3	1	170 GSM		4 colour	Gloss Lamination
7	Book-1	Flash Cards	A5	11	300 GSM		4 colour	Gloss Lamination,300 GSM duplexing, shape punching
8	Book-1	Hand wash poster	17X23 inches (approx A2 size)	1	170 GSM		4 colour	Gloss Lamination all months posters to be spiral bound with hanger. (Portrait)
9	Book-1	Domino Cards	6X3 inches	56 (28X2)	300 GSM		4 colour	Gloss Lamination , 1.5 mm Grey board duplexing, shape punching
10	Book-1	Cue Cards	3X3 inches	54	300 GSM		4 colour	Gloss Lamination , 1.5 mm Grey board duplexing, shape punching
11	Book-1	Emotion card	3X3 inches	30 (5X6)	300 GSM		4 colour	Gloss Lamination , Trim to size 1.2 mm board duplexing. Rounded corners
12	Book-2	Manual	A4	82 (78+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
13		Story - Lost in	9.5X8	12	170 GSM	170	4 colour	Gloss Lamination

	Book-2	Mela	inches			GSM		for cover, Center pinning
14	Book-2	Story - Rebuilding Manjula Housey	9.5X8 inches	8	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
15	Book-2	Story - The Untidy Children	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
16	Book-2	Poster - OCCUPATION & TOOLS	17X23 inches (approx A2 size)	1	170 GSM		4 colour	Gloss Lamination all months posters to be spiral bound with hanger. (Landscape)
17	Book-2	Poster-Clean and dirty village	17X23 inches (approx A2 size)	1	170 GSM		4 colour	Gloss Lamination all months posters to be spiral bound with hanger. (Potrait)
18	Book-2	Poster - Typical village	17X23 inches (approx A2 size)	1	170 GSM		4 colour	Gloss Lamination all months posters to be spiral bound with hanger. (Landscape)
19	Book-2	Flash cards	A5	71	300 GSM		4 colour	Gloss Lamination,300 GSM duplexing, shape punching
20	Book-3	Manual	A4	80 (76+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
21	Book-3	Story - A day at The Carnival	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
22	Book-3	Story - Marching to freedom	9.5X8 inches	8	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
23	Book-3	Story - Ali's Eid	9.5X8 inches	4	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
24	Book-3	Chart - Festival	A3	1	170 GSM		4 colour SSP	Gloss Lamination
25	Book-3	Chart - Independence Day Poster	A3	1	170 GSM		4 colour SSP	Gloss Lamination trim 2 size
26	Book-3	chart - Indian Map	A3	1	170 GSM		4 colour SSP	Gloss Lamination trim 2 size
27	Book-3	Poster - Fair	17X23 inches (approx A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Potrait)
28	Book-3	Flash Cards	A5	7	300 GSM		4 colour	Gloss

							SSP	Lamination,300 GSM duplexing, shape punching
29	Book-3	Domino card	6X3 inches	56(28X2)	300 GSM		4 colour SSP	Gloss Lamination , 1.5 mm Grey board duplexing, shape punching
30	Book-3	Cue Cards	3X3 inches	22	300 GSM		4 colour SSP	Gloss Lamination , 1.50 mm Grey board duplexing, shape punching
31	Book-3	Colour and shape strip	12.5X2.25 inches, 9X2.25 inches	3	300 GSM		4 colour SSP	Gloss Lamination, 1.2 mm Grey board duplexing, shape punching
32	Book-3	Rangoli Puzzle	6X6 inches	5 (2+2+1)	300 GSM		4 colour SSP	Gloss Lamination , 1.2 mm Grey board duplexing, shape punching
33	Book-4	Manual	A4	108 (104+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
34	Book-4	Story Book - Bee Story	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
35	Book-4	Story Book - Care and Love	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
36	Book-4	Story Book - Forest of Home and animals	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
37	Book-4	Story Book - Sathya	9.5X8 inches	20	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
38	Book-4	Flash Cards	A5	78	300 GSM		4 colour SSP	Gloss Lamination,300 GSM duplexing, shape punching
39	Book-4	Working sheet	6.77X9.56 inches	30	300 GSM		4 colour SSP	Gloss Lamination,300 GSM duplexing, Rounded corners
40	Book-5	Manual	A4	80 (76+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
41	Book-5	Story Book - Aaloo Maloo	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
42	Book-5	Story Book – Duraseya Elee	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning

43	Book-5	Story Book - Hashim	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
44	Book-5	Story Book - Minu and tree	9.5X8 inches	8	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
45	Book-5	Flash Cards	A5	41	300 GSM		4 colour SSP	Gloss Lamination,300 GSM duplexing, shape punching
46	Book-5	Poster - DIFFERENT TYPES OF PLANTS	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Potrait)
47	Book-5	Poster - TREES, SHRUBS AND CREEPERS	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Potrait)
48	Book-5	Poster - PADDY FIELD	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Potrait)
49	Book-6	Manual	A4	94 (90+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
50	Book-6	Story Book - Shilpa The engine	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
51	Book-6	Story Book - Bheema The truck	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
52	Book-6	Story Book - Race Car and Cycle	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
53	Book-6	Story Book - Three Friends	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
54	Book-6	Flash Cards	A5	57	300 GSM		4 colour SSP	Gloss Lamination,300 GSM duplexing, shape punching
55	Book-6	Working sheet	6.77X 9.56 inches	11	300 GSM		4 colour SSP	300 GSM duplexing, Gloss lamination. Rounded corners
56	Book-6	Poster – Transport/Traffic scene	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Landscape)
57	Book-7	Manual	A4	80	300 GSM	130	4 colour	Gloss Lamination

				(76+4)		GSM		for cover, with spiral binding
58	Book-7	Story - Doddahanani book	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
59	Book-7	Story – save-forest-book	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
60	Book-7	Story - sun_wind_book	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
61	Book-7	Story - Tricky Monkey	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
62	Book-7	Poster - Land	17X23 inches (approx A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Portrait)
63	Book-7	Poster - Land	17X23 inches (approx A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Portrait)
64	Book-7	Poster – Water Cycle	17X23 inches (approx A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Landscape)
65	Book-7	Flash cards	A5	24	300 GSM		4 colour SSP	Gloss Lamination, 300 GSM duplexing, shape punching
66	Book-7	Cue cards	3X3 inches	12	300 GSM		4 colour SSP	Gloss Lamination , 1.5 mm Grey board duplexing, shape punching
67	Book-8	Manual	A4	82 (78+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
68	Book-8	Story - Anjali Birthday	9.5X8 inches	12	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
69	Book-8	Story - The Umbrella and the clock	9.5X8 inches	16	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
70	Book-8	Story - School Trip	9.5X8 inches	8	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
71	Book-8	Poster - Summer	17X23 inches (approx A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Landscape)

72	Book-8	Poster - Winter	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Landscape)
73	Book-8	Poster - Rain	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Portrait)
74	Book-8	Flash cards	A5	25	300 GSM		4 colour SSP	Gloss Lamination, 300 GSM duplexing, shape punching
75	Book-8	Cue cards	3X3 inches	11	300 GSM		4 colour SSP	Gloss Lamination, 1.5 mm Grey board duplexing, shape punching
76	Book-9	Manual	A4	90 (86+4)	300 GSM	130 GSM	4 colour	Gloss Lamination for cover, with spiral binding
77	Book-9	Story - Bounce	9.5X8 inches	16	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
78	Book-9	Story – Chand mam	9.5X8 inches	16	170 GSM	170 GSM	4 colour	Gloss Lamination for cover, Center pinning
79	Book-9	Chart - Methods of mass communication	17X23 inches (approx x A2 size)	1	170 GSM		4 colour SSP	Gloss Lamination all months posters to be spiral bound with hanger. (Portrait)
80	Book-9	Chart - Somuvina Sandesha	A3	1	170 GSM		4 colour SSP	Gloss Lamination trim 2 size
81	Book-9	chart - Yakshagana	A3	1	170 GSM		4 colour SSP	Gloss Lamination trim 2 size
82	Book-9	Flash Cards	A5	12	300 GSM		4 colour SSP	Gloss Lamination, 300 GSM duplexing, shape punching
83	Book-9	Story Card - A4	A4	4	300 GSM		4 colour SSP	Gloss Lamination, 300 GSM duplexing, shape punching
84	Book-9	Working sheet	6.77X 9.56 inches	5	300 GSM		4 colour SSP	Gloss Lamination, 300 GSM duplexing, shape punching.

Note : SSP- Single side printing