Guidelines for Development of eContent for School & Teacher Education (DIKSHA)

Version 3.0

सत्यमेव जयते

Department of School Education & Literacy
Ministry of Human Resource Development
Government of India

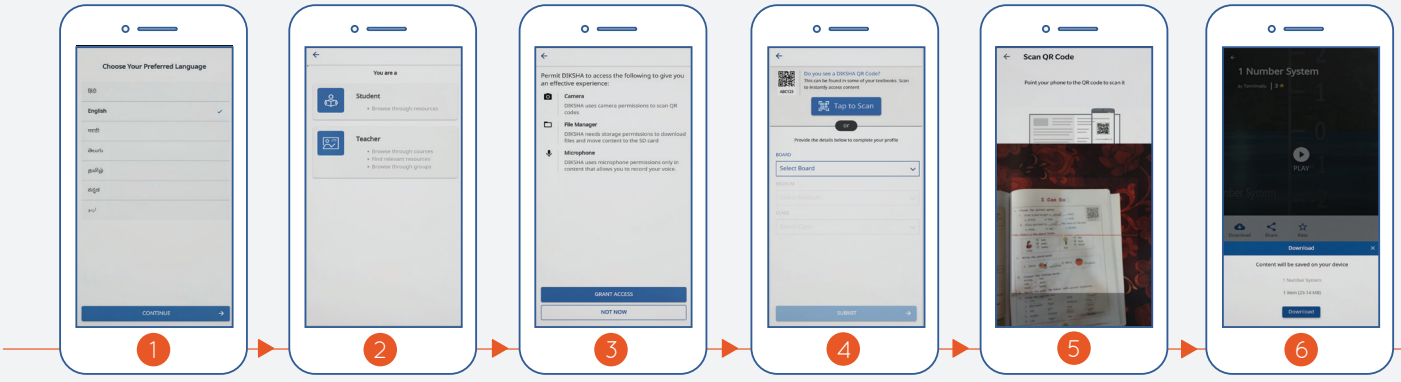
DIKSHA

Platform for Teaching and Learning

"Anytime Anywhere Learning"

Step-by-step guide for users to access e-resources linked to QR Codes

Download DIKSHA app from Google Playstore and follow the steps given below and access the e-Resources through your smartphone or tablet using DIKSHA



Select preferred language

Choose your role: Student or Teacher

Grant access and allow app permissions

Tap to scan the QR code

Focus camera on the QR code in textbook

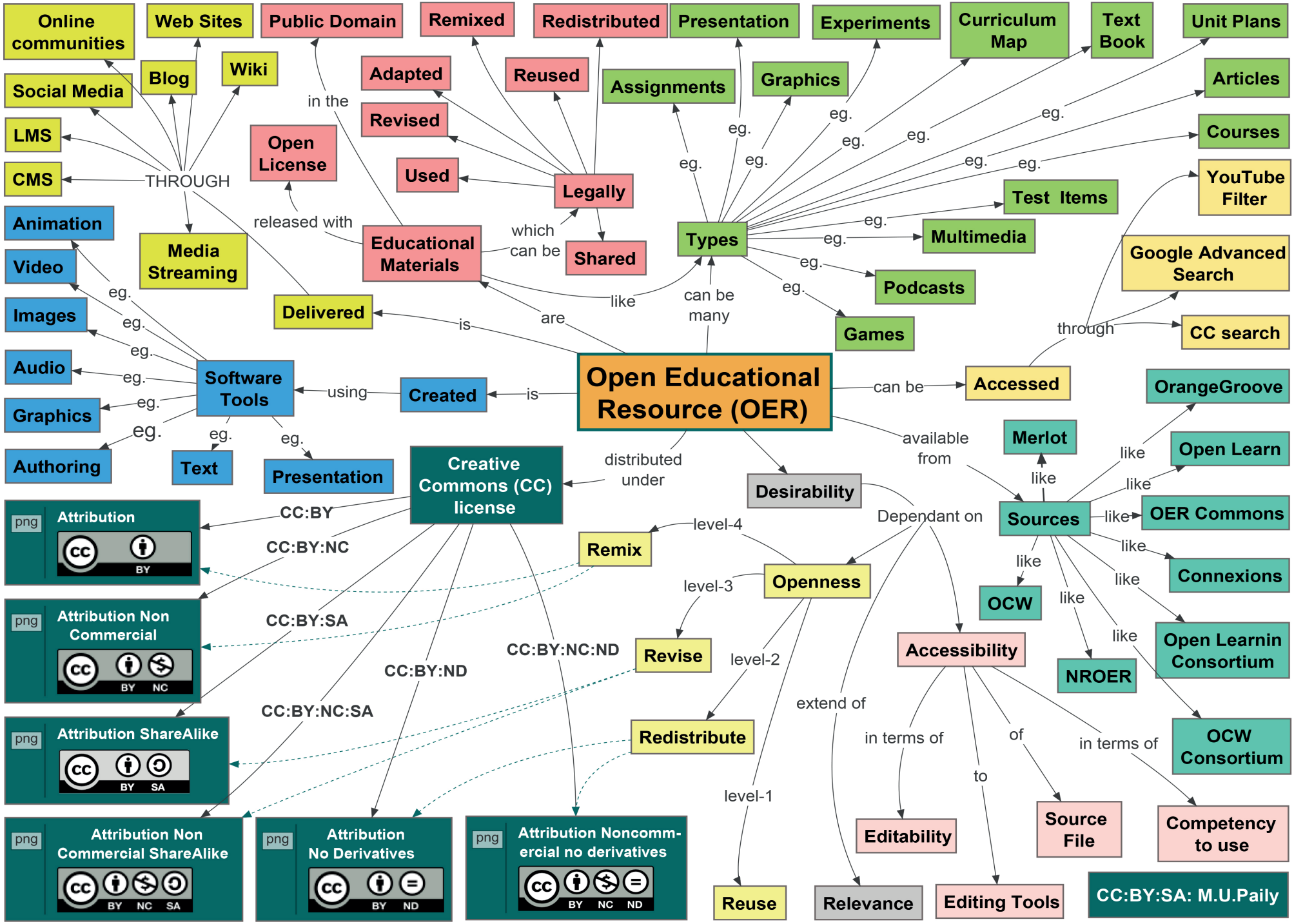
Click to Play QR code specific e-resource(s)

For accessing the e-Resources using DIKSHA on desktop or laptop follow the step stated below:

Go to https://diksha.gov.in/ncert/get and enter the alphanumeric code given under the QR code

Content

Annexure


Open Educational Resource (OER)
Creative Commons (CC) license
Software Tools
Educational Materials
Types
Sources
Accessibility
Desirability
Openness
Remix
Revise
Redistribute
Reuse
Relevance
Editing Tools
Editability
Source File
Competency to use
Accessed
Created
Delivered
Legally
Shared
Used
Adapted
Revised
Reused
Remixed
Redistributed
Public Domain
Web Sites
Online communities
Blog
Wiki
Social Media
LMS
CMS
THROUGH
Open License
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Animation
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Images
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Media Streaming
Assignments
Graphics
Presentation
Experiments
Curriculum Map
Text Book
Unit Plans
Articles
Courses
YouTube Filter
Test Items
Multimedia
Podcasts
Games
Google Advanced Search
CC search
Merlot
Open Learn
OrangeGroove
OER Commons
Connexions
Open Learnin Consortium
OCW Consortium
OCW
NROER
CC:BY
CC:BY:NC
CC:BY:SA
CC:BY:ND
CC:BY:NC:ND
CC:BY:NC:SA
level-1
level-2
level-3
level-4
Attribution
Attribution Non Commercial
Attribution ShareAlike
Attribution Non Commercial ShareAlike
Attribution No Derivatives
Attribution Noncomm-ercial no derivatives
CC:BY:SA: M.U.Paily

1 Background

Information and Communication Technology (ICT) has become one of the building blocks of modern society. Many countries now include mastering the basic ICT skills as well as 21st century skills (Communication, Collaboration, Creativity, Critical Thinking and Problem Solving) as part of the core of basic education, along with reading, writing and arithmetic. ICT has undoubtedly brought a revolution that has the immense potential to provide more engaging, collaborative and experiential learning platforms. Since the youth constitute more than 67% of the Indian population, it is mandatory to design a curriculum that aids skill development of youth along with providing quality basic education. The present government also emphasises on skill development and use of ICT for empowering the youth. The Digital India campaign (2015) has emerged as a synonym for technology revolution in India. To achieving the triple goals of Digital India Campaign i.e., skill, scale and speed the use of ICT is the way out. The government of India seeks to strengthen the use of ICT in almost every sphere and hence the campaign is centered on three key areas – digital infrastructure available for every citizen, governance and services on demand and digital empowerment of citizens.

The National Policy on Information and Communication Technology in School Education (2012) developed by Ministry of Human Resource Development (MHRD), Government of India further emphasises in its mission statement "to devise, catalyze, support and sustain ICT and ICT enabled activities and process in order to improve access, quality and efficiency in the school system". Therefore, the education system is moving toward harnessing the potential of ICT to serve the three cardinal principles of access, equity and quality. New integrated scheme – Samagra Siksha (2018) rolled out by Department of School Education and Literacy, MHRD, Govt of India while advocating for imparting quality school education and teacher education has emphasized on providing quality eContent as a pre-requisite for integrating ICT in Education.

eContent augments the learning experience by deploying various media for visualization and explanation of abstract ideas. Keeping in view the diverse needs of learners, now use of eContent has become an essential component of the teaching and learning processes. eContent is available in large numbers through various sources, but few of them are found to have the desired quality in terms of content, pedagogy as well as technical aspects. Copyright violations are rampant thereby restricting the scope of customising the eContent according to the local needs. Also with plethora of smart and mobile devices, teacher and student driven eContents are available in abundance in the market. eContents are prepared by agencies and organisations as well as individuals. In this situation, quality of such eContents may be questionable; hence it is important to develop clear guidelines for preparing quality and standard eContent.

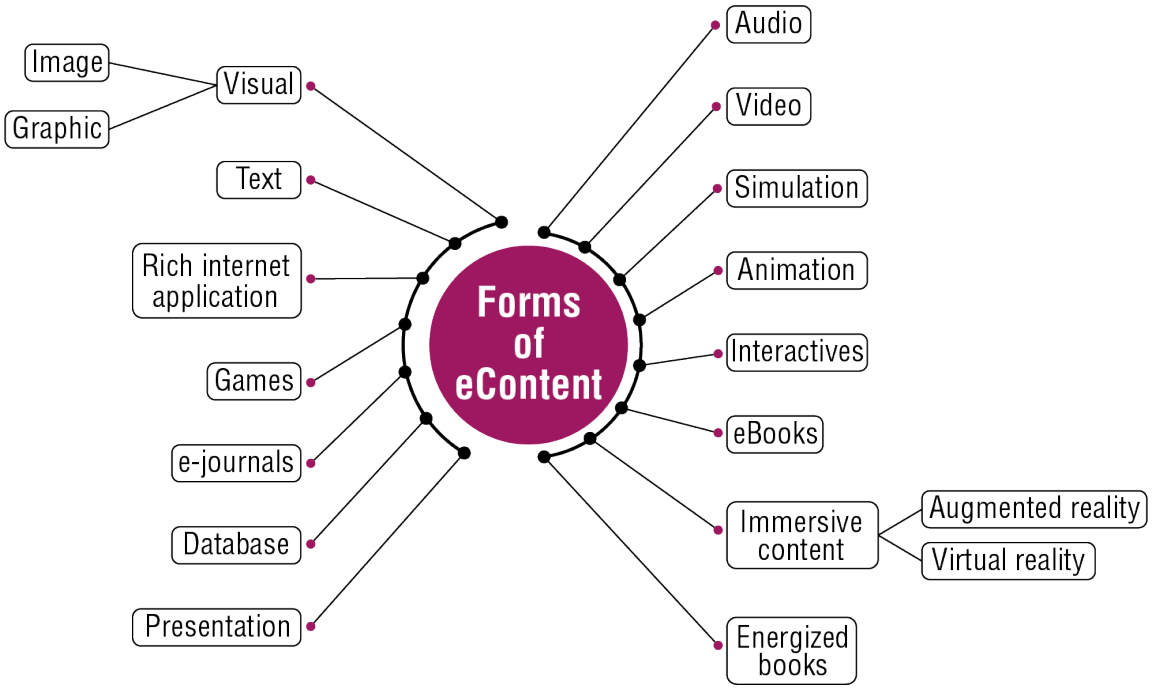
The Department of School Education and Literacy (DSE&L) MHRD, Govt. of India had set up a committee to deliberate on this issue and delineate guidelines to be used by various stakeholders

to enable planning, preparation, curation and dissemination of quality digital contents for school and teacher education. A list of experts involved for development of guidelines is annexed as Annexure - V. As part of this exercise, two workshops were organized involving experts from NCERT, SCERTs, various universities, NCTE, CBSE, NIOS, NGOs, Corporate sector, practising teachers etc. Based on these deliberations, a guideline providing the details of the process of developing eContent has been developed. The various phases of the eContent development process are as follows:- analysis, design, development, implementation, evaluation. The specific activities of each phase are also clearly defined in the guidelines. It also provides the parameters for assessing the quality of eContent during the process of development as well as curation by various stakeholders like organisations, administrators, teachers and students.

2 Guidelines for Developing eContent

eContent is any form of learning material available digitally which a learner access or interacts with so as to achieve related learning outcomes. eContent is becoming popular because it allows flexibility in terms of time, place and pace of learning. A resource rich environment is necessary for teaching and learning to be effective. However, many of the educational resources are not easily accessible because of issues related to copyright. Hence, there is a movement to produce learning resources and make them available with open licenses which are known as Open Educational Resources (OER). Open Educational Resources (OER) are freely available. Openly licensed materials and media are useful for teaching, learning and assessing as well as for research purposes. Wide variety of OER is available for free use for teachers, instructors, researchers and students. If used appropriately, digital learning resources can add considerable value to the quality of teaching and to the learners' experience.

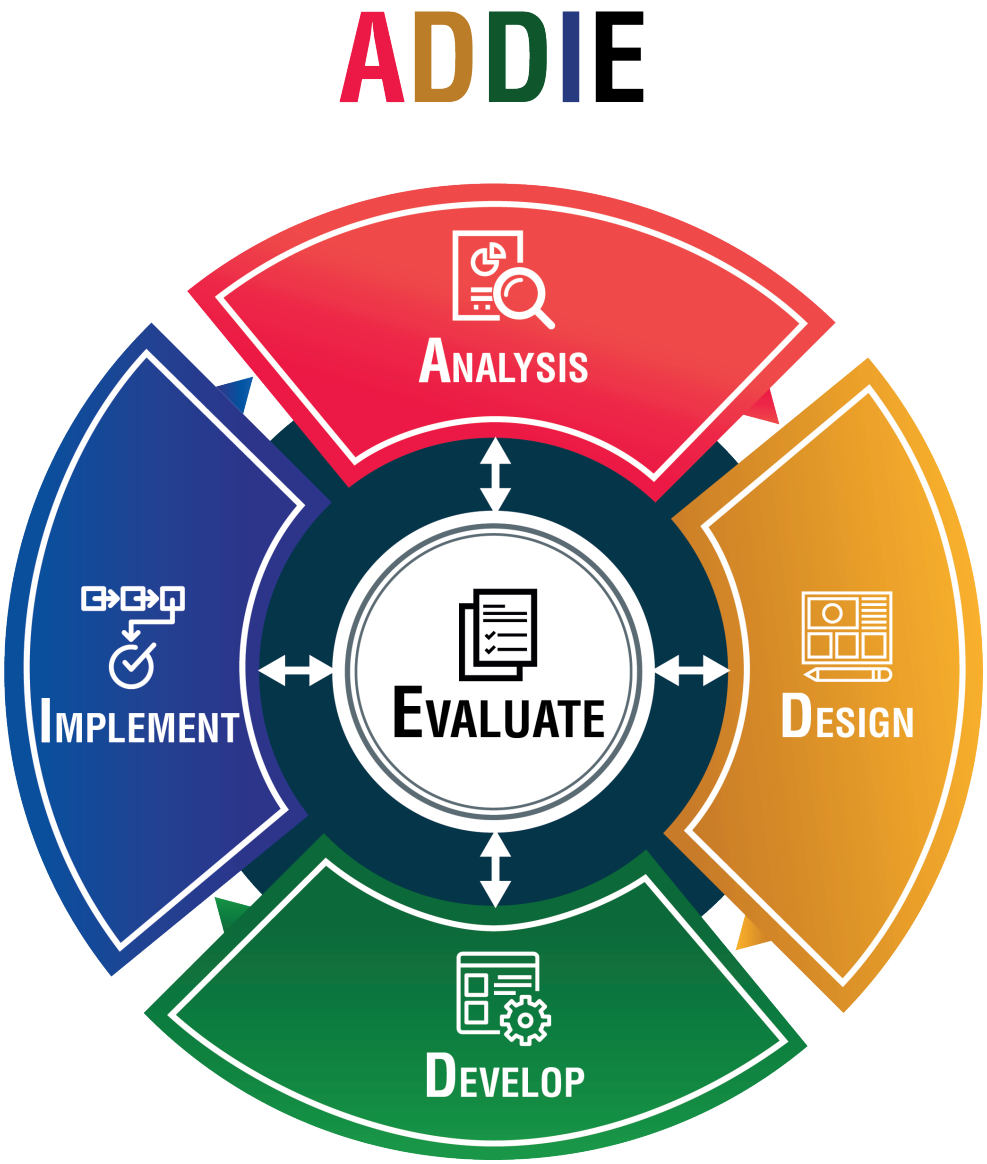
eContent is often made up of separate units or a combination of text, video, images and sound. These are the building blocks which are often used to make composite learning objects that can be exhibited in various presentation formats. Various forms of eContent are shown below:



Each type of resource has several presentation formats. Depending on the nature of the content and purpose of the resource, one can choose the presentation format while developing the eContent. eContent should be saved in the appropriate file format. (For file formats Refer ***Annexure – I***)

Process of developing eContent

eContent design, development depends upon the nature of the content and its target learners. It will also depend on the quality and complexity of the learning to be achieved. Instructional design is the practice of creating instructional experiences that make the acquisition of knowledge and skill more efficient, effective and appealing. The process broadly consists of determining the current status of learners' understanding, defining the end goal of the instructional material and creating some 'intervention' to assist the transaction. This systematic approach provides a step by step process for the analysis of the learners' needs, the design and development of the material. There are various instructional design models available. Most of the models involve the process of analysing the learners' needs and goals of the instructional material development, development of a delivery system and content, pilot study of the material developed, implementation, evaluation, refinement of the materials etc. In designing and developing the eContent, a suitable instructional design approach based on our requirements can be adopted. One of the most generic, common and popular approaches for instructional design is ADDIE.



Step 1: ANALYSIS

In the first phase, the suitability of the eContent to be developed is examined. It is related to the analysis of need, context, learner/target and content.

Parameter	Description	Output	Tasks
Need analysis	It is very important to define the needs before developing the eContent. Needs can be identified from the perspective of different stakeholders like learners, teachers, subject experts, practitioners, policy makers etc. It can also be based on the findings of primary and secondary research studies and can be inferred from the current scenario of the educational setup.	Need assessment document/ statement	• Capture needs from multiple stakeholders using appropriate method • Identify the suitability of eContent for the proposed topic • Review existing eContent and identify the gaps • Refer multiple sources of literature and capture the need • Prioritise needs based on stakeholders‘ requirement
Context analysis	It is the collection of data to understand the physical, technical and socio-cultural contexts in which the eContent will be used.	Context profile (Exemplar to be linked)	• Identify the constraints and opportunities in the physical, aspects of the learner and learning environment i.e., infrastructure available to learner, learning spaces, etc. • Identify the constraints and opportunities in the technical aspects of learner and learning environment such as availability of devices, equipment, internet, electricity etc. • Identify the constraints and opportunities in the socio-cultural aspects of learner and learning environment such as language, socio-economic status, belief system etc. • Articulate the kind of learning environment - informal or formal etc.

Parameter	Description	Output	Tasks

Learner analysis (Target Audience)	It refers to capturing data with respect to the target audience.	Learner profile (Exemplar to be linked)	• Identify and specify the user as students, teachers, educators, trainers, parents, professionals etc.
			• Capture target audience profile including aspects of demographic, cognitive, physiological and socio-cultural like:
			  • previous knowledge
			  • learning styles
			  • level of motivation
			  • interests
			  • cognitive, sensory and physical disabilities
			  • socio-demographic background etc.

Content Analysis	Content analysis defines the scope, appropriateness and nature of the eContent. Good content comprehension is required before designing and developing content. It also helps in understanding the purpose and mode of using eContent	Content analysis document - Content outline appropriately validated raw content, identified learning domain and classified content	• Identify key ideas and prepare a mind map • Identify the nature of the content as facts, concepts, generalisation, principles, processes etc. so that the appropriate media and presentation format can be selected at later stage. • Check quality of raw content for cognitive appropriateness, factual accuracy, inclusiveness and accessibility. • Identify the skills and values, if any. • Specify modality of usage - standalone series, supplementary, complementary, integrated etc. • Content like teaching/ training, self-learning, assessment, awareness, skill development etc.

Step 2: DESIGN

Designing phase involves Instructional Strategy Design, Visual Design, Technical Design and Prototype Testing. The overall principles guiding this are Universal Design For Learning (Refer ***Annexure - II***). The design should balance between engagement, expression and action. A design document should be prepared at this stage including the outputs of all the parameters listed below:

Dimension	Parameter	Description	Output	Tasks
Instructional Strategy Design: It includes the pedagogical considerations of creating eContent.	Learning Objectives	Learning objectives describe what the learner will be able to do at the end of using the eContent. Specification of objectives is the first step of design stage.	Defined learning objectives	• State objectives clearly such that they are realistic, relevant, achievable and measurable • Align objectives to national / state curriculum frameworks and specific learning outcomes (national / state).

	Content Structure	Organising the content logically	Content map	• Organise the content in chunks.
				• Specify alignment to previous knowledge of the learners.
				  • Structure of the content as:
				  • Simple to Complex
				  • Known to unknown
				  • Concrete to Abstract
				  • Specific to general
				• Prepare content map to represent the structure of the content.

Dimension	Parameter	Description	Output	Tasks
	Learning Strategies	Designing learning strategies with reference to learners characteristics, content, learning objectives, etc.	Strategy statements	• Identify appropriate learning strategies corresponding to the learning outcomes. • Design strategies so that eContent will be motivating and interesting. • Ensure active participation of learners. • Align with the curriculum framework and learning objectives. • Design learning experiences to facilitate the metacognition process wherever possible.
	Evaluation Strategies	Specifying evaluation strategies in terms of modalities and format in alignment with objectives, and learning strategies.	Evaluation Scheme	• Integrate immediate and constructive feedback mechanisms. Ensure assessment of the learning outcomes. • Design assessment with flexibility in terms of pace, time, frequency, media etc. to address the diversity of the learners. • Try to design alternative assessment strategies such as peer assessment, AI based assessment, etc. • Ensure assessments are created in multiple formats to maintain motivation and engagement. • Design mechanisms to maintain and track progress reports of learners.
	Selecting suitable media	Selecting the appropriate media or an integration of audio, video, graphics, animation; simulation models, virtual reality (VR), augmented reality (AR) etc.		• Use multiple media to make eContent accessible to all learners, including those with cognitive, sensory or physical disabilities. • Select appropriate presentation format based on the nature of content.

Dimension	Parameter	Description	Output	Tasks
Visual Design	Designing Graphical User Interface (GUI)	It involves designing the • Input Controls: buttons, text fields, checkboxes, radio buttons, drop down lists, list boxes, toggles, date field • **Navigational Components**: breadcrumb, slider, search field, pagination, slider, tags, icons • **Informational Components:** tooltips, icons, progress bar, notifications, message boxes, modal windows • **Functionalities :** Calculator, Calendar, map, notepad etc.	Prototype - GUI	• Create design to be attractive, interesting, intuitive, and innovative • Select the colour schemes and icons such that they are visible, appealing and relevant. Design theme specific and content relevant interface. • Use appropriate input controls, navigational and informational components as well as functionalities • Maintain consistency in design. • Avoid cluttered and complicated visual scheme.
	Deciding Fonts	It involves choosing fonts as per type, size, compatibility, language, special characters, symbols etc.	Prototype - Screens	• Select commonly used fonts compatible with all platforms. • Use acceptable Unicode fonts or regional languages fonts. • Use appropriate notation and syntax for expressing science equations and math symbols, separator, identifiers, constants, standard algebraic equations. • Font size should be legible. Serif fonts should be used. Colours should be theme and age appropriate. Font colours should be in contrast with the background.

Dimension	Parameter	Description	Output	Tasks
	Planning Layouts	Arranging content and elements in a hierarchical order.	Prototype - Layout	• Ensure proximity to facilitate the viewer to follow and correlate pieces of information to construe their meaning. • Check the layouts; whether they are aligned and clearly defined, reflect information and consider all elements appropriately. • Make sure that visuals are impressive and follow colour psychology. • Select or create graphics and animations to communicate information accurately and adequately.
Technical Design (shift to development section)	Preparing a Technical Design considering Technical aspects	Selecting appropriate file formats, media, technical tools and platforms ensuring the following principles: 1. Accessibility 2. Usability 3. Adaptability 4. Scalability 5. Sustainability 6. Interoperability	Prototype - Technical Design	• Make sure that the eContent is accessible to diversified users. • Develop eContent which is easy to navigate, revise and reuse. • Make sure that the eContent can be produced by integrating various media formats and can be localised once developed. • The platform should support multiple users to access eContent simultaneously. • Make sure that the eContent is accessible through any device, operating system and browser. • Prepare design which is easy to use and also pleasant to use on a range of devices.

Dimension	Parameter	Description	Output	Tasks

Prototype Testing (shift to development section)	Testing beta version of a sample module of the eContent	Testing eContent prototype consisting of all features and formats to be used in the designed eContent.	Approach and level of inter-activity defined in the design document	• Identify sample prototype with all features and formats for testing.
				• Define objectives of prototype testing for its
				  • Graphical User Interface
				  • Accessibility
				  • Usability
				  • Adaptability
				  • Scalability
				  • Sustainability
				  • Interoperability
				• Select a sample target group that represents the whole group.
				• Fix the duration for testing of prototype
				• Create tools for testing and document data, observations, and feedback.
				• Avoid changes in developmental processes or content during the prototype testing.

For the large scale development of eContent, analysis of human resources and cost incurred is to be identified at this stage. An estimation of the requirements of workforce for developing the eContent in terms of their skills, availability, technical expertise etc. is to be analysed. A rough timeline for the development process is to be designed. Cost estimation based on the analysis can enable the development process.

Step 3: DEVELOP

This stage relates to the creation of story board.

Dimension	Parameter	Description	Output	Tasks
Storyboard	Writing story board	Designing a storyline and storyboard as a reference document for production team. A storyboard is a visual script for development of the eContent. The storyboard consists of frame wise detailing of all elements like text, visuals, audio, video, interactivities etc. Storyboard also provides role wise instructions i.e., production team, graphic designer, animators etc separately.	Storyboard of a particular eContent	• Ensure that the storyboard is logical and sequential. • It should align with the content map created at design stage. • Provide clear instructions for the developers to use the appropriate media elements. • Get the Storyboard reviewed by content, pedagogical and technical experts. • Use appropriate format to develop storyboard based on the form of eContent • Clearly state the topic, target group, objectives, content coverage, media type, presentation format, development team etc. • Storyboard can include instructions in various forms like text, audio, visual etc. • Include formative assessment • Use examples, illustrations and visuals as part of eContent in the storyboard. • It has to be free from gender discrimination, religion/ community/ regional/ caste biases, vague words, • It should address inclusiveness.

Dimension	Parameter	Description	Output	Tasks
Production	Development of media element	Media elements refer to the different types of audio. visual, textual elements that go into the digital learning resource.	Media elements	• List down the various media elements that need to be identified/ created based on the storyboard. • Identify and select appropriate tools (preferably Free and Open Source) that meet the necessary compliance standards to develop the media elements. • Identify and allocate human resources for the production of individual media element. • Schedule the production timelines for each media element and ensure coordination at functional level. • Develop the media elements as per the storyboard. • Ensure that the media elements follow the Instructional strategy, visual and technical design guidelines during the process of development. • Get each media element reviewed by subject expert, technical expert and pedagogical expert before integration.
	Programming and integration	Individual elements are to be integrated as per the story in logical sequence and linkages.	Final Master copy of eContent	• Link media elements in logical sequence and consonance with storyboard. • Test the eContent after linking media elements for coherence and flow. • Make changes, if required. • Maintain all versions of eContent with appropriate nomenclature.

Dimension	Parameter	Description	Output	Tasks
Preview	Post production evaluation of eContent	Reviewing eContent based on techno - pedagogical parameters	Post production evaluation sheet	• Develop a post-production evaluation sheet. • Form a preview team that includes subject matter, technical and pedagogical experts. • Check technical and instructional aspects • Capture experts' feedback in post-production evaluation sheet. • Incorporate the necessary changes and finalize the content.
Metadata Profile	Developing the metadata	Creating the data about eContent in a standard format (Refer ***Annexure - III***). Metadata helps users to find relevant eContent.	Metadata Sheet	• Use standard vocabulary, abbreviations as the listed in the glossary. • Write in standard format so that it supports interoperability, facilitating distribution of information across platforms. • Apply standards to describe items. • Pool related digital objects in a collection resulting into a new class. • Specify terms and conditions for using of eContent. • Do not use certain characters like bullets, En or Em dashes, curly quotation marks, bold and italic text, underlining, slash, subscripts, superscripts, ampersands etc.

Dimension	Parameter	Description	Output	Tasks
Delivery strategy	Developing delivery strategy document	A comprehensive implementation strategy document to be developed including learning outcomes, content coverage, method of delivery, hardware and software requirements	Delivery strategy document	• List required hardware and software with specifications. • Specify modalities for delivery of the eContent. • List prerequisite knowledge and skills required for facilitator and learner to use the eContent. • Provide step-by-step instructions with necessary visuals for using eContent. • Include usage policy
Process Documentation	Documenting the process of development	Documenting the detailed process of eContent development.	Process document	• Elaborate purpose, relevance, target audience followed by Subject & content details. • Mention procedure for developing, testing and modifying the eContent. • Provide adequate supporting documents at annexure • Mention terminology used in documents with brief introduction. • Present the content in simple language with illustrations.

Step 4: IMPLEMENT

In the implementation phase, piloting is done to ensure the usability and quality of the content.

Dimension	Parameter	Description	Output	Tasks
Testing	Field testing	Based on the guidelines in the implementation strategy, document the eContent to be used. Also validate in terms of usability, technical features, expected outcome etc. Testing the developed eContent on a sample of the target group to establish its validity and usability.	Test Reports	• Decide target group. • Following implementation strategy document, try out the final eContent on the representative sample of the target group. • Develop observation schedule and use to collect information for validating the eContent. • Enlist changes to be done to maintain the validity of the content. • If required, modify eContent and implementation strategy document based on the field try out.
Compliance	Product compliance with all available standards and requirements	Declaring terms of the compliance of the eContent with all standards and requirements.	Compliance Report	• Briefly explain how the content conforms to available technical standards and requirements.

Dimension	Parameter	Description	Output	Tasks
Certification	Licensing and releasing	Certifying the usage policy of the eContent enabling the user to access and use the eContent based on the terms and conditions of Intellectual Property Rights (IPR) and Copyrights. (Refer ***Annexure - IV***)	Certificate report	• Release eContent under a specific license. • Describe the usage policy in simple terms. • Display the license at a prominent place in the eContent. • Specify IPR and license policy for future upgrades. • Mention the period of the usability of the eContent. • Describe terms for reusability of the eContent.

Step 5: EVALUATE

The evaluation phase consists of two parts i.e. Formative and summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation determines the adequacy of the distributed materials in achieving the course objectives.

Dimension	Parameter	Description	Output	Tasks
Feedback Mechanism	Developing feedback mechanism	Develop feedback mechanism keeping in view various stakeholders and purpose	Feedback form & platform	• Develop feedback tools for collecting feedback from different stakeholders • Mount the feedback tool on the platform for easy access. • Items for feedback should relate to technopedagogy, content and contextual relevance.
Improvement Mechanism	Collection and utilization of feedback	Improving eContent based on the feedback received from various stakeholders	Recommendations for modifications	• Develop a mechanism that provides for feedback to flow into the system to initiate improvement thereafter. • Develop a system to maintain records of stakeholders‘ feedback and action taken.

3 Guidelines for Curating eContent

Curation in general refers to process of identification, evaluation and selection of appropriate information meeting as per requirement. Curation of eContent involves following process:

- Identification of eContent relevant to the needs in terms of subject, content, age group, method etc.,
- Evaluating it as per the standard parameters.
- Selecting the appropriate eContent to suit the requirement of learners and teachers.

Curators are people (individual/ groups) or services that do the meticulous work of browsing and selecting the items of utmost relevance to the stakeholders. Teacher, teacher educator, student, principal or anyone in the school system can be a curator. Curator must be able to critically analyse the eContent from various perspectives to identity the appropriate one. Following parameters shall be considered by the curators while curating eContent:

These parameters guide the curator in selecting the appropriate eContent. To check the quality of an eContent, the evaluator needs to have the following knowledge & skills:

1. Mastery over subject matter
2. Understanding of pedagogy in terms of learner, methods of teaching, context etc.
3. Knowledge of ICT related concepts, tools, resources and its use in education
4. Experience of Teaching
5. Understanding of evaluation tools
6. Skill of analysing, interpreting and comprehending
7. Use of ICT for evaluating and documenting (Desirable)

Keeping the parameters in view, several tools are developed for evaluating eContent by various stakeholders i.e., developers, teachers/ teacher educators, students and administrators/ principals. These tools would help in selection of appropriate eContent.

Tool for evaluation of eContent - Developers/ Administrators/ Principals/ Teachers

This tool can be used by developers, school administrators / principals, teachers/ educators for assessing the quality of eContent. Developers shall use the tool to check their eContent before releasing it for use. Teachers can use this tool to analyse the quality of eContent before using it in the educational process. Principals can use this tool to understand the quality of eContent while selecting/ purchasing the eContent for the school. However, principals/ administrators need to take the following into consideration in case of purchasing eContent:

1. Cost of the eContent
2. Shelf life of eContent i.e., the time period for the eContent can be used
3. Number of users who can access the eContent
4. Number of access points (systems, login etc.) through which eContent can be used
5. Terms and conditions in terms of modifying, customising etc. eContent to suit the needs of the school
6. Support by the seller/ vendor in terms of technical support, academic support (training and handholding), human resource etc.

Name : _____ Gender : _____

Qualification : _____ Designation : _____

Organisation : _____

Instruction

As a teacher, you have mastered subject and the process of eContent development. You are requested to evaluate the given eContent in respect of objectives, content coverage, sequencing of the content, target group, language etc. in the following - statements related to above mentioned aspects are given. Against each statement five-point scale is given. These are Strongly Agree (SA), Agree (A), Disagree (D), Undecided (U) and Not Applicable (NA). Read each statement carefully and select one out of the given five options, which best describes your decision about the eContent. Try to be as objective as possible during the evaluation of eContent:

S. No.	Statement	SA	A	D	U	NA
Content						
1	Content is aligned with Curriculum/ Learning outcomes.					
2	Content is accurate.*					
3	Content is up-to-date.*					
4	Content range and depth are appropriate to learner needs.*					
5	Content is comprehensible for the target groups.*					
6	Level of difficulty is appropriate for intended audience.					
7	The information is arranged in a logical sequence.					
8	Content integrates real-life/ real-world experiences.					
9	Content chunking and sequencing are appropriate.*					
10	Content is not derogatory to any gender/ community/ group.*					
11	Content is supported by relevant examples, illustrations, data, statistics etc.					
12	Content is free from biases like language, caste, community, region, religion, gender etc.*					
13	Content addresses the relevant concerns like environmental, peace oriented values, children with special needs etc.					

S. No.	Statement	SA	A	D	U	NA
Pedagogical consideration						
1	Instructional goals, objectives and learner outcomes are clearly stated.					
2	Prerequisite knowledge has been stated clearly.					
3	Instructional prerequisites are clearly stated or easily inferred.					
4	Suitable for a wide range of learning/teaching styles.					
5	Promotes learner engagement					
6	Promotes active learning					
7	Promotes thinking.					
8	Helps in the development of application ability.					
9	Helps in retaining the interest.					
10	Encourages interaction.					
11	Encourages learners' creativity.					
12	Encourages learners to work independently.					
13	Encourages self-paced learning.					
14	Promotes development of basic ICT skills.					
15	Media type/ form of eContent/ presentation format is appropriate to the content treatment and learners*.					
16	Concepts are clearly introduced.					
17	Concepts are clearly developed.					
18	Concepts are clearly summarized.					
19	Supports integrated approach and thematic linkages across curriculum					
20	Non-technical vocabulary used appropriately.					
21	Technical terms are consistently explained introduced.					
22	Pedagogy/ andragogy is innovative.					
23	Supports extending or building upon learners' basic knowledge.					
24	Sequencing and chunking allows for appropriate contextual use.					

S. No.	Statement	SA	A	D	U	NA
25	Adequate/appropriate pre and post activities of using eContent (viewing/ listening/ writing ect.) are suggested.					
26	Adequate/appropriate assessment/evaluation tools/ techniques are provided.					
27	Self-assessment questions/ activities covers the content/ subject matter wholistically.					
28	The assessment is in consonance with the objectives and learning outcomes.					
29	Questions addressing different level (remembering, comprehending, evaluating, creating etc.) are included in the assessment.					
30	User inputs are tracked.					
31	Feedback is non-threatening, immediate, positive, motivational.					
32	Feedback is user-sensitive and appropriate to user's previous responses.					
33	Qualitative feedback is used wherever appropriate.					
Technical						
1	Volume and quality of sound are appropriate.					
2	Narration is appropriate to instructional purposes (pacing, modulation, clarity, gender etc.)*					
3	Music and sound effects are appropriate and effective for instructional purposes.					
4	Appropriate support materials are provided.					
5	Visual effects/ transitions are used appropriately to highlight story and topic*.					
6	Animation/graphics are appropriate and clear.					
7	Titles/captions are appropriate and clear*.					
8	Presentation is logical and varied*.					
9	Pacing is appropriate.					
10	Variety of mediums used.					
11	Media elements have unity/ congruence / sync with each other*.					

S. No.	Statement	SA	A	D	U	NA
12	Character size, typeface is appropriate.					
13	Layout is logical and consistent*.					
14	Packaging is suitably designed.					
15	User interface is interactive and user-friendly.					
16	Illustrations/visuals are effective/appropriate.					
17	Makes balanced use of graphics, animation, audio, video ect.					
18	Feedback and progress is integrated appropriately.					
19	Navigation is easy.					
20	User navigation is appropriate to the target audience.					
21	Hyperlinks are appropriately linked.					
22	Help function is provided and appropriate.					
23	Appropriate instructions for using eContent have been provided.					

For Administrators/ principals:

S. No	Parameter	Remarks
1	Cost of eContent	
2	Durability of eContent	
3	Number of user license	
4	Number of access/ login	
5	Terms and condition for modifying, customising etc.	
6	Support (technical, academic, human resource)	
7	Interoperatability	

Note: Criteria for making decision - Content is recommended for use only if the response is 'Agree/ Strongly Agree' for the starred statement. Even if one starred statement has other responses, then it is not recommended for use.

Tool for evaluation of eContent - Student

This tool can be used by a student to decide upon the quality of eContent for learning. Even before using any eContent as part of presentations/ projects etc., it is mandatory to evaluate the eContent to understand its suitability and usability.

Name of the Student : _____ Gender : _____

Name of the School : _____ Class : _____

Instruction

In the table given below, the statements are listed to define the quality parameters of eContent. Against each statement there are three responses: Yes (Y), No (N) and Undecided (UN). Read each statement carefully and select one out of the given three options, which best describes your decision about the eContent. Try to be as objective as possible during the evaluation of eContent.

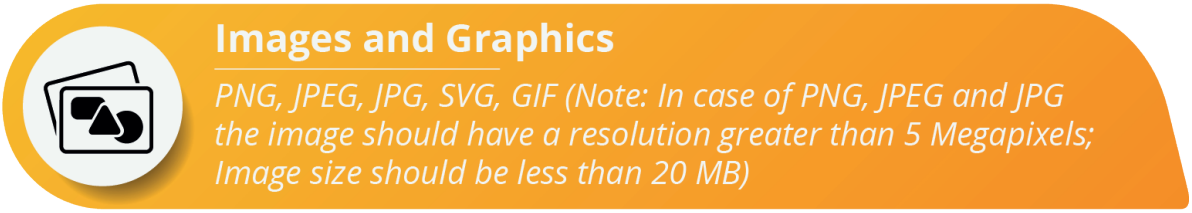
S. No.	Statement	Y	N	UN
1.	Latest information is given.			
2.	Content is relevant to the topic.*			
3.	Objectives have been stated clearly in the beginning of the topic.*			
4.	Prerequisite knowledge have been stated clearly for each topic.			
5.	Supports self-paced learning.*			
6.	Given examples are related to the daily life.			
7.	Given visuals are relevant to the content.*			
8.	Language of the content is easy to understand.*			
9.	Appropriate colours have been used in diagrams.			
10.	Animation is integrated in the content.*			
11.	Supports active learning.			
12.	Exercises/ activities are integrated with the content.*			
13.	eContent can be accessed easily.*			
14.	Clear instruction has been given for using eContent.*			

S. No.	Statement	Y	N	UN
15.	Hyperlinks are given at required places.			
16.	Hyperlinks help in better understanding the content.			
17.	Promotes self-learning.*			
18.	Promotes active learning.*			
19.	Provides feedback.*			
20.	Helps in retaining the interest.*			
21.	Help function is provided for users.			
22.	Provides scope for tracking the progress.			
23.	Additional references are provided.			
24.	There is a provision for self-check in the eContent.*			
25.	Appropriate for level/ class/ age group.*			
26.	Well designed and self-paced.			
27.	Navigation is easy and user-friendly.			

Note: Criteria for making decision - Content is recommended for use only if the response is 'Yes' for the starred statement. Even if one starred statement has other responses like 'No' or 'Undecided', then it is not recommended for use.

Annexure – I

File Formats of eContent



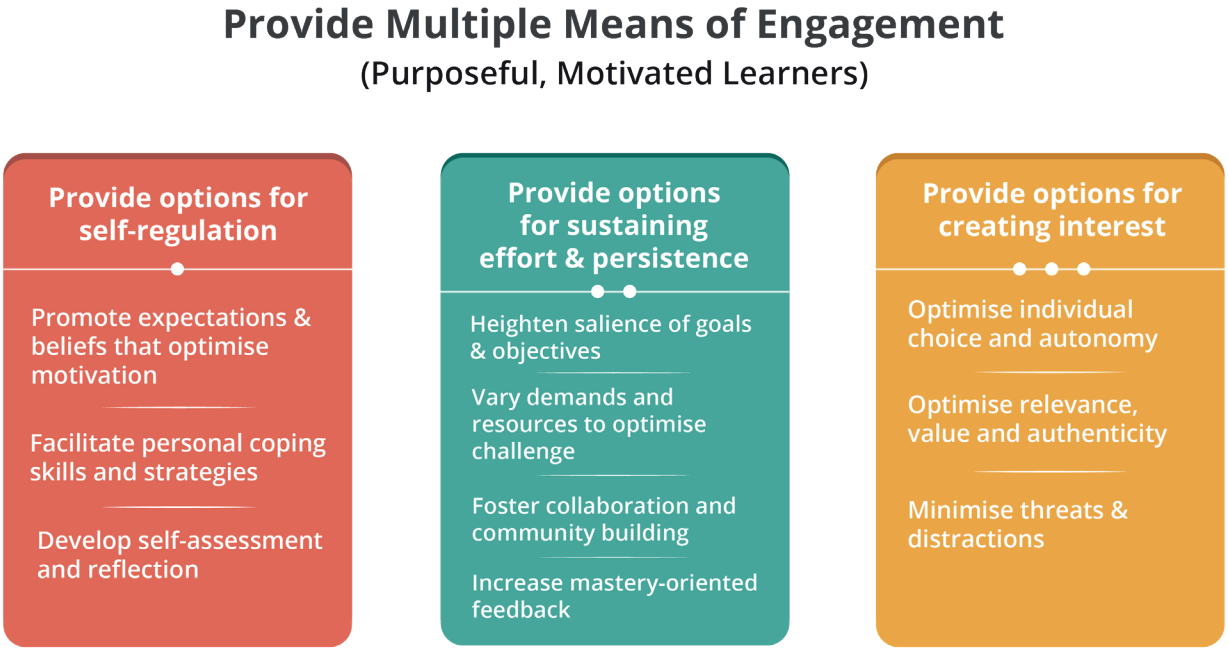
Annexure – II

Universal Design of Learning (UDL) as a Framework for Creating Accessible Material for All Children

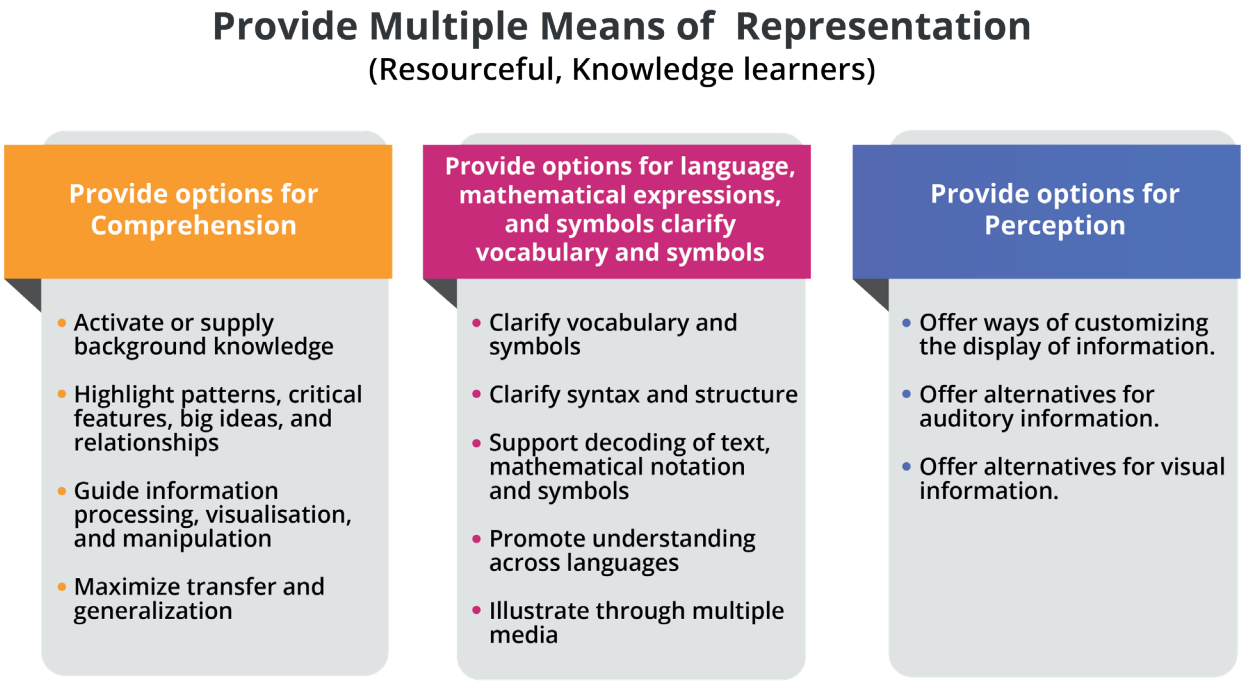
Universal Design of Learning (UDL) is a framework that guides the design of learning environments making them accessible for all. The ultimate goal of UDL is to support all learners of diverse backgrounds and abilities. UDL aims to change the design of the learning environment rather than to change the learner. The learning environments are being carefully and systematically designed to reduce barriers, so as to engage all the learners in conceptual and meaningful learning. The three basic principles of UDL are to:

1. Support affective learning, provide multiple, flexible options for engagement
2. Facilitate recognition learning, provide multiple, flexible methods of presentation
3. Ensure strategic learning, provide multiple, flexible methods of expression and apprenticeship

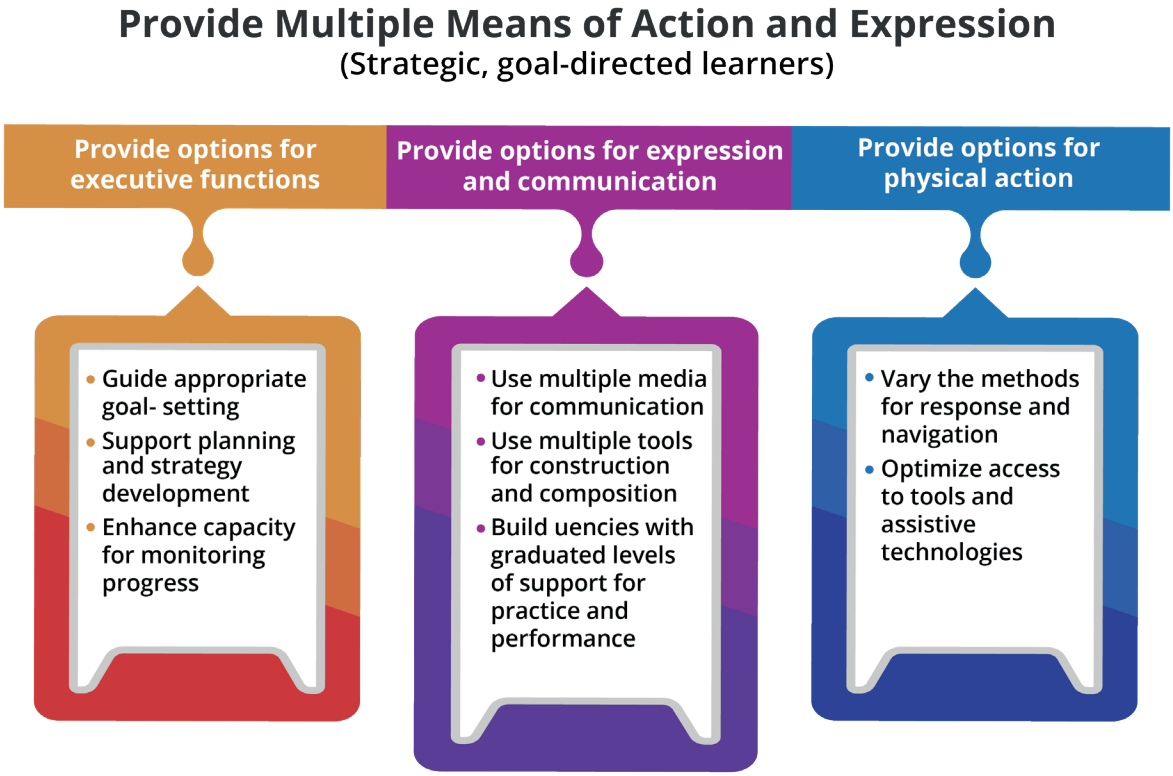
There is a need to focus on each of these principles for designing a learning environment in an inclusive set-up. Firstly, engaging the learners depending upon their learning needs and cognition is primary. Offering choices in learning can develop self-determination and a sense of accomplishment among learners and increase the degree to which they feel connected to their learning.



Secondly, offering learners different ways of representation of the content helps in better learning.



The third important principle of UDL is 'Action and Expression' where alternative media for expression is important. Such alternatives not only reduce media-specific barriers to expression among learners with a variety of special needs, but also increase the opportunities for all learners to develop a wider range of expression in a media-rich world. For example, it is important for all learners to learn composition, not just writing, and to learn the optimal medium for any particular content of expression and audience.



EPUB Accessibility Guidelines

EPUB 3.0 is an advanced format, texts, audio, video and even interactive contents in various subject areas (including Science, Maths, etc.) can be included as per need. Accessibility guidelines for EPUB have been published and adopted by leading world standard bodies. These guidelines are available at https://www.w3.org/Submission/epub-a11y/. In brief, the following guidelines should be adhered to while creating EPUB files.

1. All text must be available in a logical reading order
2. Separate presentation and content
3. Provide complete navigation
4. Create meaningful structure wherever possible
5. Define the content of each tag: Include semantic information to describe the content of a tag
6. Use images only for pictures, not for tables or text
7. Use image descriptions and alt text
8. Include page numbers
9. Define the language(s)
10. Use MathML
11. Provide alternative access to media content
12. Make interactive content accessible
13. Use accessibility metadata
14. Use only Unicode fonts
15. Ensure validity EPUB Check

Guidelines for Developing Webpage and Mobile App

Comprehensive guidelines are available from W3C and Government of India for creating websites and apps that are accessible to all. Basically all such digital products should conform to the WCAG 2.0 minimum Level AA. The guidelines with implementation techniques and examples are available easily on the web. Detailed information is available in these guidelines on proper treatment of text, forms, tables, images, multi-media etc.

WCAG 2.0: https://www.w3.org/TR/WCAG20/
GIGW: https://web.guidelines.gov.in/

Annexure – III

Metadata

Metadata Labelling

Metadata provides the description of an item and improves discoverability. Metadata helps to ensure that teachers and students can find digital resources relevant to the educational concepts. Quality metadata allows educators to organise digital resources into useful categories. It also allows resources to be easily identified in content management systems and education portals. Accurate metadata increases the likelihood that relevant digital content will be discovered and used by teachers and students. The principles for discerning quality metadata are:

- it conforms to vocabularies and standards in a way that is appropriate to the materials in the content collection, the users of the collection, and current and potential future uses of the collection items.
- it supports interoperability, facilitating distribution of information to many different systems, for example, jurisdiction repositories and portals.
- it applies authority control and content standards to describe items and collate related digital objects in a collection.
- it includes a clear statement of the conditions and terms of use for the digital content
- it supports the long-term curation and preservation of digital collections.

Dimensions	Description
Metadata Profile	A metadata profile describes digital content using a set of predefined attributes such as title, author, or educational objective. There are many different metadata profiles in use.
Controlled Vocabulary	A list of terms related to e-resources to be developed and the catalogue to be shared for reference.
Production Process	The creation of metadata needs to be taken into consideration from the outset of the project and throughout the development of digital resources to ensure that: • metadata creation is included in the project scope. • the method of capturing the metadata is planned. • appropriate resources are available for creating and reviewing the metadata. • writers and reviewers have a clear understanding of requirements. • metadata complies with relevant standards and specifications.

Editorial Style	When creating metadata there are certain characters that are best avoided as they can cause problems in downstream systems, displaying as gobbledegook (language that is meaningless) on users' computers. It is prefered not to include any of the following characters in metadata: • bullets • en or em dashes – use a spaced hyphen for a textual dash • curly (smart) quotation marks – set your computer for straight (dumb) quotes • bold and italic text – use single quote marks for anything that would normally be in italics • underlining • slashes • subscripts and superscripts • ampersands – spell out as 'and'.

Annexure – IV

Intellectual Property Rights and Copyrights

Intellectual Property

This section provides basic definition, information and guidelines, pertaining to Intellectual Property issues. In the absence of clarification provided here, all legal frameworks for Intellectual Property are applicable as present in the Copyright Act (1957), Designs Act (2000) and other relevant laws.

Defining Intellectual Property

Intellectual property is the name given to legal rights which protect creative works, inventions and commercial goodwill. It includes a collection of various rights: copyright, patents, designs, trademarks, other types of confidential information, trade secrets, expertise or know-how, reputation, assets that are not necessarily intellectual but have commercial value, chip topography, and other sector-specific rights. Basically Intellectual Property Rights are designed to provide remedies against those who steal another person‘s ideas or work. For example, if a person writes a computer program, he/she will be able to take legal actions to obtain an injunction against anyone who copies the program without his/her permission.

Any content creator, as an individual or an organisation who creates eContent aligned to the guidelines, should be able to claim intellectual property on the same, provided the content is originally created. It is proposed to adopt the Creative Commons Licensing Protocol so that the content can be freely shared and customised as per local needs.

Creative Common Licensing

Copyright is a legal right as per a country’s law that grants the creator of an original work the exclusive rights for its use and distribution. This is usually only for a limited time. Traditional educational materials, such as textbooks, are protected under conventional copyright terms. Previously copyright was binary i.e. all rights retained or available in public domain. However, alternative and more flexible licensing options are available as a result of the work of Commons. Creative commons (CC) is a global non-profit organization which provides free legal tools i.e. Copyright licenses. It is an organization that provides ready-made licensing agreements that are less restrictive than the “all rights reserved” terms of standard international copyright. These copyright licenses enable sharing and reuse of creativity and knowledge. These legal tools allow us to reuse the work of others. The vision of CC is to help people to realize the full potential of the internet. CCs offer other legal and technical tools that also facilitate sharing and discovery of creative works such as CC0 a public domain dedication. CC0 is for rights holders who wish to put their work into the public domain before the expiration of copyright. Another license, typically used by developers of OER software, is the GNU-General Public License from the free and open-source software (FOSS) community. Open licensing allows the user to adopt and adapt the work done by someone under different circumstances. Open licensing allows us to use the materials that would not be easily permitted under copyright alone. It is essential to know that open licensing is a concept within copyright law.

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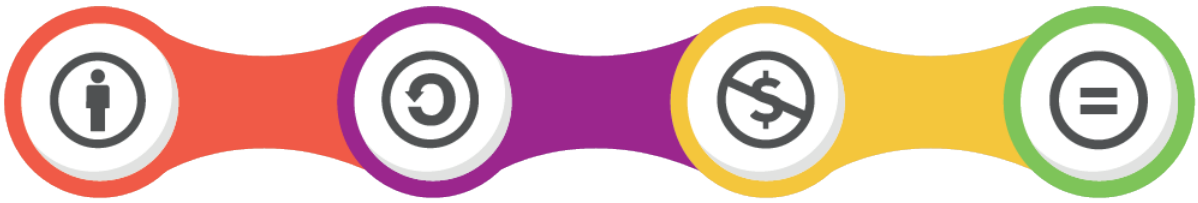

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Annexure – V

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11.	Dr. R. Asir Julius, Assistant Professor, SCERT, Chennai, Tamil Nadu	- *Member*
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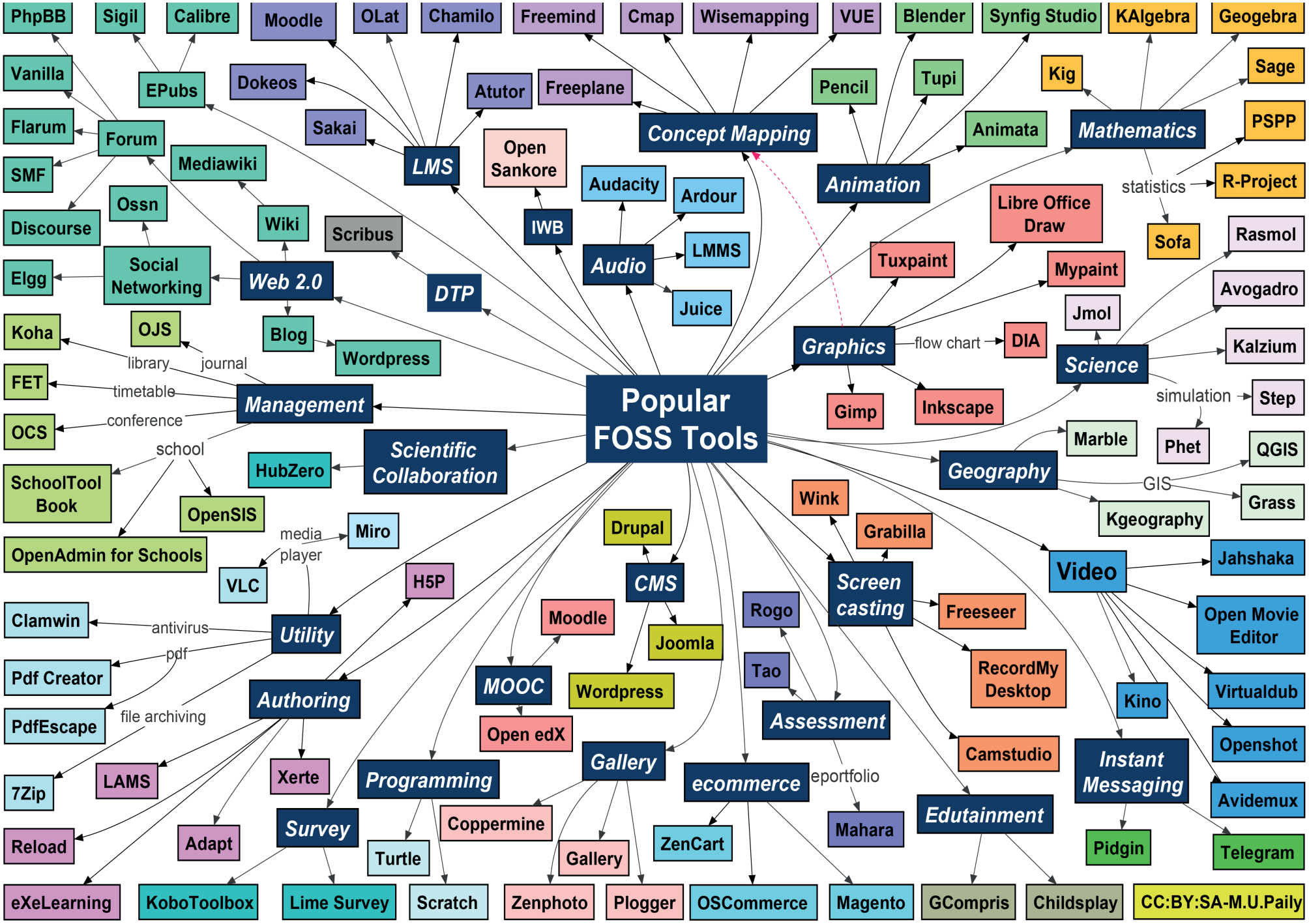
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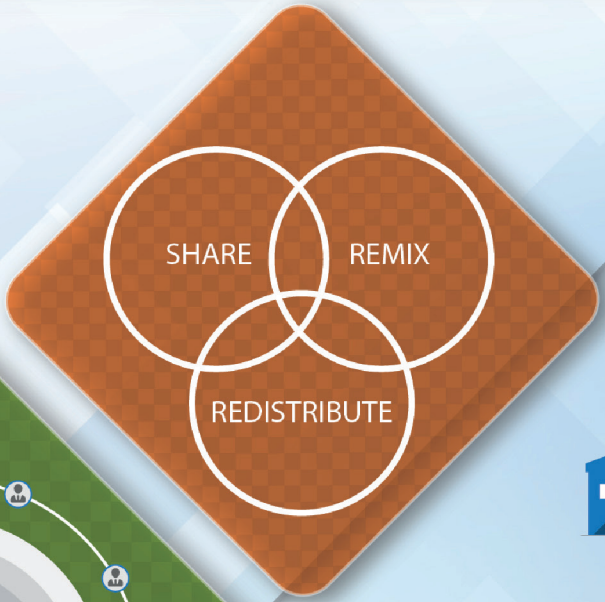

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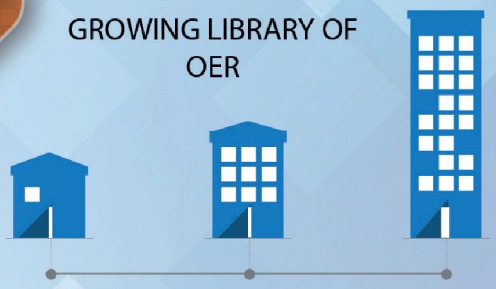

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