Concept Note on E³ English Language Lab (ELL)

Introduction

As part of the Public Education Rejuvenation Mission, the Government of Kerala has undertaken massive reforms in school education since 2016-17. These reforms aim to enhance academic excellence, upgrade physical infrastructure, integrate digital technology, and develop digital resources to promote inclusive and equitable quality in education. Kerala stands as the first state in India to fully digitize its public education sector, with KITE (Kerala Infrastructure and Technology for Education), a government enterprise under the General Education Department, serving as the implementing agency for ICT-enabled education in the state.

Under the Hi-Tech school project, an investment of Rs.493.50 Cr has been made in 4752 secondary schools, and Rs.300 Cr has been allocated for Hi-Tech Labs in 11275 primary schools. This initiative has led to the establishment of Hi-Tech classrooms and labs in every school across the state. Kerala's commitment to the use of Free and Open Source Software (FOSS) has not only resulted in significant cost savings to the State Exchequer, but has also facilitated the integration of world-class educational software released under FOSS licenses. Additionally, the state boasts its own customized Operating System bundled with all necessary packages. This FOSS approach ensures unrestricted access, allows for free editing, copying, and adoption of educational content, benefiting a multitude of students.

Background

In 2017, the Director of General Education initiated measures to establish language labs in all District Institutes of Education and Training (DIETs). KITE, Kerala, supplied computers, headphones, and microphones to facilitate the setup of language labs in DIETs. Despite this infrastructure, the Department of General Education faced a challenge: the absence of language lab software aligned with the state curriculum. The government's policy against proprietary software, with its limitations on access, users, and high costs, further motivated the need for a Free and Open Source Software (FOSS) solution. Additionally, private software often focused on British or American pronunciation, neglecting the pluricentric nature of the English language.

Since 2017, KITE has been dedicated to developing FOSS-based language lab software in English, aligned with the state curriculum and contemporary teaching-learning practices. Before the E-Language Lab software, KITE introduced the 'MGuru Language Lab software' in 2017-18, an online web application for students from classes one to seven. However, internet dependence posed challenges in areas with poor or no connectivity, prompting KITE to focus on developing a FOSS-based, easily deployable Digital Multimedia English Language Lab Software.

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Goals

- To enhance the language proficiency of students from grade 1 to 10 using appropriate Free and Open Source Software (FOSS) platform based on curriculum and learning objectives
- To develop a user-friendly, interactive and replicable FOSS public platform that can be installed in the computers deployed in Government and Aided schools in the state
- To develop a game-like, competency-based FOSS platform to provide students with opportunities to enhance their listening, speaking, reading, writing, pronunciation, grammar, and vocabulary through the use of 'stories'
- To enable teachers to use the E^3 English Language Lab platform to promote the progress of students using assessment and feedback.

Curriculum and Pedagogy of English

The National Curriculum Framework (NCF) 2005 and Kerala Curriculum Framework (KCF) 2007 embrace social constructivism as the foundation for their pedagogic structure. These frameworks emphasize collaborative learning, learner autonomy, continuous and comprehensive evaluation, concept attainment in the mother tongue, the shift from information to knowledge, democratization of education, learner identity, and critical pedagogy. The curriculum advocates discourse-oriented pedagogy for learning English at all levels. Discourse Oriented Pedagogy, endorsing Chomskyan conceptualization of language as inherent knowledge, shifts from the teacher-centric behaviourist paradigm to the learner-centric social constructivist paradigm. Recognizing that isolated linguistic elements lack meaning in communication, discourse-oriented pedagogy focuses on meaningful expressions within a context. Kerala's revised textbooks align with this pedagogy, ensuring skill development through various discourse genres, reading, and writing for diverse purposes and audiences.

At the primary level (Classes 1 to 4), the focus is on developing basic language skills—listening, speaking, reading, and writing—using diverse discourse modes. Learning experiences aim to integrate these basic skills, considering that different language forms can serve various functions. Simple discourses like conversations, songs/rhymes, descriptions, and stories are targeted at the primary level. The upper primary level (Classes 5 to 7) encourages students to construct a wider array of discourses, including stories, descriptions, conversations, poems, narratives, puzzles, riddles, games, letters, notices, posters, advertisements, diaries, and reports. The linguistic complexity of these discourses aligns with defined indicators for effective learning.

The Significance of Digital Language Labs

A language lab serves as a computer-based digital multimedia environment, providing students with practical experiences in integrated listening, speaking, reading, and writing. Numerous studies on computer-based language labs highlight students' positive attitudes toward ICT in language classrooms, correlating with improved English language learning achievement. Yau and Cheng's study (2012) exemplifies that integrating technological components enhances students' confidence in language learning. Language labs offer diverse interactive learning resources, personalized teaching-learning experiences, and highly stimulating content, thereby elevating learner motivation.

Not only do language labs benefit students, but they also offer advantages to teachers. The participatory environment of a language lab facilitates the transfer of language skills, often challenging to achieve in a classroom due to time constraints. The individual attention afforded to learners, along with the teacher's ability to monitor and manage their learning growth, significantly increases efficiency. However, it is crucial to note that a language lab cannot substitute the classroom teaching-learning process. Construction of knowledge occurs in an environment where students collaborate in mixed-ability groups, share ideas, pose questions, and teachers encourage them to surpass individual capabilities. A balanced integration of the classroom teaching-learning process and language lab experiences is recommended for promoting enhanced learning outcomes.

Features of the Proposed E^3 English Language Lab Software

The E-Language Lab aims to offer practical learning experiences for all students, encompassing listening, speaking, reading, and writing within meaningful contexts. The software's content should facilitate the application of skills and knowledge acquired in the classroom. Careful alignment of themes and subthemes in the language lab content with English course books for classes 1 to 7 is essential. Adopting a story-based approach is a priority, recognizing narratives as foundational to diverse discourses. Stories, drawn from sources under Creative Commons licenses, will serve as conduits for other discourses, including narration, description, dialogue, diary entries, letters, debates, discussions, thoughts sharing, and songs. Emphasis will be placed on stories and activities that stimulate critical thinking, problem-solving, collaboration, creativity, and communication skills among students.

The E-Language Lab software is designed to be highly interactive, featuring engaging digital multimedia content comprising text, colourful illustrations, audios, videos, graphics, and animations. The software should facilitate audio and video recording, allowing students to submit assessments. The digital content will integrate listening, speaking, reading, and writing skills, fostering vocabulary and language element competency across different proficiency levels. Interactive activities based on stories, such as drag-and-drop, multiple-choice questions, true/false, picture drawing, quizzes, riddles, puzzles, and audio/video recording, aim to provide

interactive, game-like, competency-based and enjoyable learning experience for students. Each student will have the opportunity to individually enhance their communication skills.

Features of the Proposed E-Language Software:

- High-quality, grade-specific stories and activities aligned with curricular expectations and learning outcomes.
- Student login option enabling access to stories, assignments (reading, writing, grammar, vocabulary), quizzes, riddles, puzzles, and the creation and submission of various discourses (stories, conversations, songs, poems) with the ability to record oral or video versions for feedback and assessment.
- Options should be provided for students to draft, edit and resubmit their responses/answers to the activities
- There should be facilities in the software for storing all the performances/responses of students including audio and video responses in the digital platform
- The platform should have the options for assessing students responses including the use of AI for assessing open-ended assignment activities
- Integration of course content and activities to reinforce students' classroom-acquired skills and competencies through practical application.
- Teacher login facility to enable monitoring and tracking of each student's progress, providing individualized feedback and support.
- Head Teacher (HM) login option for overseeing the activities of students across all classes, accessing Activity Reports, and reviewing Performance Reports for all students.

Pedagogy and Technology of the Software

All Government and Aided schools in Kerala are equipped with computers and IT labs, although internet connectivity remains a challenge, particularly in remote areas. To overcome this hurdle, KITE decided to develop an offline mode English language lab software as part of the E3 English (Enjoy, Enhance, Enrich) project, aiming to improve students' English language proficiency in a delightful learning environment through the use of hi-tech labs in schools. The Government, through GO (Rt.) No.804/2020/G.Edn dated 17.02.2020, sanctioned the roll-out of the E3 English project in schools.

The development of the language lab software pauses major challenges such as:

- Developing digital content aligned with the themes, subthemes, and learning outcomes of state curricula and textbooks.
- Creating a free and open-source language lab software compatible with computers in schools, catering to both standalone machines like desktops and laptops, as well as multiple computers connected through LAN

- Customising a Learning Management System (LMS) in harmony with the features of the proposed E-language software, aligning with the social constructivist pedagogy for teaching English.

In addressing these challenges, a careful evaluation led to the identification of Moodle as a suitable LMS, meeting majority of the specified requirements in its basic structure. Moodle stands out for its foundation in social constructionist and learner-centered pedagogy. Its modular structure allows for the addition of new functionalities through plugins, providing flexibility and user-friendliness. Given its high acceptance among teachers and master trainers in KITE, Moodle was chosen for customization to fulfil all requirements of the language lab software. Notably, Moodle is web-based, but the limited availability of high-bandwidth internet in schools prompted the customization of Moodle into a stand-alone application that operates without internet. The proposed E Language Lab software must adhere to the following specifications:

- FOSS based: The software should be free and open source, easy to adopt, and deployable anywhere as a digital multimedia language lab.
- Hardware compatibility: The software should be installable on existing hardware in schools, piggybacking on available laptops and software.
- Decentralized implementation: Schools should be able to use the software without centralized server systems, reducing implementation costs.
- Local network compatibility: The software should work through local networks or standalone computers, compatible with the KITE-GNU Linux Operating System.
- User-friendly: The E Language Lab software should be easy to install on all school computers and compatible with both LAN-connected and standalone machines.
- Multilingual support: The platform should support the development of software in languages like Malayalam, Tamil, Kannada, Hindi, etc.

Process of Development of E Language Lab Software

Conceptualization Stage:

During the conceptualization workshop organized by KITE, English language experts, practicing teachers, and KITE Master Trainers specializing in software development deliberated extensively on the academic and technological features of the proposed E Language Lab software. Key performance indicators were identified across academic, technical, and general domains, as well as the technology architecture of the software.

Academic Indicators:

a. Alignment with curriculum, learning processes, and outcomes

b. User-friendly, story-based, and activity-based content

c. Should be based on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK)

d. Embedded assessment indicators for teacher feedback

e. Option for generating students' task completion and performance reports

f. Presentation of digital content in an interesting, interactive, and gamified mode for promoting language skills at 4 proficiency levels.

Technical indicators:

a. Code stability

b. Code reusability

c. Hierarchy of users

General:

a. Cost-effectiveness

b. Data privacy

c. Network independence

d. User-friendliness

e. Replicability

f. Adaptability

g. Mode of License (GNU-GPI)

Technology Architecture:

The technology architecture is based on Web Architecture, including Client-Side and Server-Side components. E-Cube English Language utilizes Moodle, an Open Source Learning Management System, as an intranet web solution with a three-tier architecture—client side (HTML, H5P, CSS, JavaScript), middle layer (Apache Web Server, PHP), and data layer (Maria DB). The solution is packaged as a Debian package for easy installation in Ubuntu Systems, either as a standalone application or within a LAN.

Process of Content Development:

The core of E Language Lab software revolves around stories and related activities. Stories, selected from 'Storyweaver,' are integral for children to acquire language skills in an integrated manner and foster critical thinking, communication skills, and creativity. The academic team identified 10 stories for each of the four levels. KITE initiated the development of activities based on listening, speaking, reading, writing, vocabulary, and language elements, along with creating video and audio versions of the stories.

The four levels are:

1. Level 1 (classes 1 & 2)
2. Level 2 (classes 3 & 4)
3. Level 3 (classes 5 & 6)
4. Level 4 (classes 7 & 8)

Process of Software Development:

KITE's software team opted for a customized version of the Moodle LMS for developing the E Language Lab software. The following activities were undertaken during customization:

1. **Customization and Integration**

- Presentation slots for stories in different modes such Audio, video, PDF for reading and the like.

- Presentation of key vocabulary items
- Quiz-type activities
- Open-ended writing, speaking & performing activities
- Slots for audio/video recording activities

2. **Customization of user privileges**

    Customisation of User privileges such as student login, teacher login, HM Login and Admin log in

3. **Class management and user enrolment**

    Allocation of classes. Capable of handling classes from 1 to 8 and capacity up to 50 students in each class. 16 class divisions from A to P were accommodated.

4. **Integrating new plugins**

    New plugins were integrated to promote better navigation and user experience Integrate add-ons (themes) for easy navigation

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5. Converting online mode to offline mode

Converted the software platform to a stand-alone one in order to make it work without network and also work in local network without network.

Try-Out and Refinement:

The developed E Language Lab software should be piloted in select schools, and feedback may be collected from students, teachers, and experts. Based on the feedback from SCERT, students, and teachers, the software should revised.

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