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ViblySpace: Addressing the Digital implementation gap in Indian K-12 schools

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Abstract

In 2020 Indian's education policy comes with a big change to support, teach coding and digital skill in schools. But there is a gap between what the policy says and what actually happen in ground level, it works on paper well but not in class rooms. We find that while government supported platform like DIKSHA[2] provide essential curricular content, but a specific gap exists for interactive learning in the direction of current technology era. We need an interactive platform that fill this gap with a ground level to a useable skill, there is ViblySpace a platform as a complementary to DIKSHA, offering grade-specific coding pathways, designed for coding spaces built specifically for Indian schoolchildren. Where various supportive section and page to help of people without any prior knowledge of coding. This paper examines these barriers through an analysis of existing digital platforms and a focused case study of infrastructure deployment in Gautam Buddha Nagar, Uttar Pradesh.

Keywords: Digital Literacy, Policies, Technology, Diksha, Viblyspace

Introduction

- **The Policy**

In 2020, our government came with a policy — an idea that said students should learn coding and digital skills. This was necessary at that time, not only for students but also for our nation. A nation with a big population and a deep future insight must make the right path for its people. But as we know, most of the work remains only on paper steps, not in actionable start points.

- **The Ground Reality**

But who is responsible for this gap? Several methods exist to deal with it, yet no one has come forward to truly address it. There is a real example of this. We were students of government schools where the world was limited to books. There was no explanation of what digital skills are, why we need technology, what impact it has on a nation, why it is important not just for a career but also as a citizen, and how we can help build our nation through it.

- **Existing Platforms and the Awareness Gap**

If we talk about existing platforms, they only work on a business model. They operate on a standardized and competitive stage, not according to the needs of basic schools where education is reduced to clearing exams and getting marks. This is the big problem — how to implement digital skills in such a system. There is also a need to create awareness about why we need digital skills and digital literacy to make a safe and sound world.

- **Digital infrastructure deployment in Gautam Buddha Nagar**

There is pure study and data that show how some government schools are able to get digital infrastructure. In that direction there are HCL foundation and NPCL come to support digital infrastructure in schools. In that direction they work accordingly to fulfill their goal. Let us discuss first HCL foundation how it can work in this direction, it provide differ think to support schools like mobile stem & digital lab, lab include robotics kits, digital learning tools, internet enabled system. HCL foundation support 72 government schools (54 primary & 18 secondary schools). NPCL may be doing work like that HCL foundation but little bit differ by providing smart interactive panel, digital teaching equipment and other source.

- **ViblySpace: Our Response**

As we were students that faces problem of at that time. To fill this gap we created a platform according to schools, based on grade level. There we answered these questions - what digital skills are, why we need technology, what impact it has on a nation, why it is important not just for a career but also as a citizen, and how we can help build our nation through it.

There are various coding languages that full-fill education policy of 2020 where students should learn coding and digital skills.

This platform include grade level framework like – grade 5 to 6 fundamental of coding, grade 7 to 9 starting stage of skill and grade 10 to 12 advance level of skill with current technology (AI, IOT, Database, web-app e.t.)

Literature Review and Design Principles:

Here why viblyspace, Students of different ages get the content according to their grade level but learning stage is simple according to their capability and needs because a 5th grader and a 10th grader have different learning capability. Let clarify that statement by some sources.

- **Cognitive Load Theory**

According to **J. Sweller (1998)**, there is a way to learn something new that make it easy and understandable for any kind of age persons. He describe how a memory or we can say that how can mind learn. He just divided his theory into three parts First is natural difficult level, make it step by step from base to ending point; it can't be replace but manageable.(**Intrinsic Load**). Second is teaching presentation to any persons because every age personality has owns learning capacity and understanding ability (**Extraneous Load**). Third are genuinely thoughts or mental efforts like practices, questioning (**Germane Load**)

That's why viblyspace platform concern about it and ensure every grade level student should be learn not as mug up. And feel comfortable with every new technology.

This is why viblyspace make is design a grade level framework like – grade 5 to 6 fundamental of coding, grade 7 to 9 starting stage of skill and grade 10 to 12. And the advantage of viblyspace platform it does not affect students major study.

Project Based Learning

In most of the schools there is a common mistake that is learns theory, not in practical. That's making difference and need a platform where students not only learn but also make it happen in real life.

Let we understand it why we need project based learning.

In 1980 Seymour Papert, he writes a famous book to show how children can be learning by making mistake, create something's new itself. He idea is simple that is learning = practice + mistakes + improvement.

That's why ViblySpace provide project based learning in every grade level with direction and starting step to critical thinking.

Preparedness of Schools

According to a research paper in **2020 by Singh & Tiwari,** they discuss about how schools are ready for coding classes and labs. This study shows that most of the schools are not ready for that. Because there is a need to update the syllabus according to curriculum and a proper structure for system. They need a proper syllabus, technology, systems and train teachers. Also they need to provide a good resource structure. This is a critical study about it, because every wining line has a starting line. ViblySpace is not fulfilling all gaps but it can be a starting line in that direction. Because this platform has all basic points to start it with minimal need of systems and hardware to setups. It can be start with simple steps just go to its website link and open in any browser and use it. If any school wants to it, in their desktop then just download it desktop version from Microsoft play store.

Digital Resources and Right Guide

There is another important factor that is a real problem with schools. Some schools have digital source but lack of content and a clear platform. Let understand it through a research paper written by **Pareek & Parashar (2025).** This paper show about digital resources and teachers gap with technology understanding means that there are several schools with digital source like computers lab, internet and other system. But if there is not a person who actual know that the use of technology, make a concern about it. That's why viblyspace provide a TRP section that may help teachers to teach students with differ languages.

Summary of Design Principles

DP1 (Grade Segmentation) – grade 5 to 6 fundamental of coding, grade 7 to 9 starting stage of skill and grade 10 to 12. Match each student's mental capacity, **Intrinsic Load, Extraneous Load, Germane Load** (**J. Sweller (1998**)).

DP2 (Hand on Projects) Learning = Practice + Mistakes + Improvement. **(Seymour Papert (1980))**.

DP3 (System structure) - They need a proper syllabus, technology, systems and train teachers. (**Singh & Tiwari**).

The ViblySpace Platform:

- **System Overview:** ViblySpace is web-application based platform with a desktop application, and make it internet-free. Because, Internet in a normal school is not easy to accessible. ViblySpace with desktop version is a sense to make it real. It supports almost all browser with it all function and good user interface.
- **Grade-Level-System**: Each level has different content, different difficulty and different goal according to grades. Grade 5 to 6: Start stage with basic fundamental of coding with interactive block-based thinking. Basic html, css starting interaction with code, color, font, back-ground color & others.

Grade 7 to 9: Starting stage of real skills, in html, css, javascript, python and java. As web-development, python basic & computational thinking. Grade 10 to 12: Advance skill with easy to learn with project based learning. Object-oriented-

based learning with java (basic), AI. Other Course: Database System, App development (basic), IOT, Introduction of AI. This grade level system directly follows the DP1 so that each student receives content according to their capability as explained by Cognitive Load Theory (Sweller, 1998).

- **Editor:** This platform include an in-build code editor to help students to go through out exercise and make idea to real life project support only web-development.
- **Others Sections:** ViblySpace has other useful sections that make it more easy to use and interactive. Viblyspace provide a TRP section that may help teachers to teach students with differ languages. Courses with basic understanding of new trend and technologies like Database System, App development (basic), IOT, and Introduction of AI.

Discussion

As earlier of introduction, under the policy of 2020 and the policy says that coding is mandatory for all grades (grades 6 to 12) to learn. But there is gap how to achieve it from scratch. Schools have different curriculum and needs. Here comes viblyspace platform align to schools curriculum with no cost of setup and easy to use. ViblySpace provide project and quizzed based learning in every grade level with direction and starting step to critical thinking. And a special section for teachers to support their teaching path with real world example. This directly applies our two design principles- content for students (DP1) and hand on project learning (DP2).

Existing platform have a subscription model that is some time very high. If some platforms provide low cost of structure, but not stand out to schools requirement. ViblySpace fill this, no need of budget for any schools just download it desktop version and make your first step in digital literacy direction.

There is some limitation in viblyspace, use of code editor that is work only for web-development languages like html, css & javascript. Not support any other coding language. However, a critical analysis of DIKSHA's architecture reveals a fundamental limitation with respect to coding education. The platform was focused on a content book based. This limitation is not a flaw in DIKSHA's design but rather a reflection of its intended scope. The main purpose of DIKSHA App is covering all subjects from primary to secondary levels. But it is not efficient for when it comes to teaching coding.

Results and Analysis

The evaluation of ViblySpace is based on qualitative analysis of its impact on student engagement, learning effectiveness, and accessibility. The platform demonstrates a significant improvement in student participation due to its interactive and project-based approach.

Students are able to understand complex concepts more effectively when they are presented through practical exercises and real-time coding environments. The integration of project-based learning enhances retention and encourages independent problem-solving.

From a usability perspective, the platform’s simple interface and offline accessibility make it suitable for deployment in schools with limited technological resources. Teachers also benefit from the structured guidance provided through the platform, which simplifies the process of delivering digital education.

However, the system's performance is influenced by the availability of basic infrastructure such as computers and electricity. Additionally, the current version supports a limited range of programming environments, which may restrict advanced learning opportunities.

Overall, the results indicate that ViblySpace provides a practical and effective solution for improving digital education in school environments.

Comparative analysis

Feature	Traditional Systems	DIKSHA	ViblySpace
Interactivity	Low	Moderate	High
Coding Practice	No	Limited	Yes
Cost	High	Free	Low
Accessibility	Limited	Moderate	High
Teacher Support	Minimal	Limited	Strong

Conclusion

The conclusion of this paper is that there is a need of platform according to ground reality of education policy of 2020, we can see there are various platforms exist but structure and the need of schools environment get stack for that. And the system for that platforms may be differ for differ platforms. ViblySpace is a simple platform to fill that gap, and it is not fill that gap with potentially but it can be first step for that direction with minimal step to setup in any schools, where at least have basics computers labs. It can't solve all policies problem that under goes to education policy act 2020, but everything start with a starting point not as ending line and require a base line to start. So viblyspace can be a starting point in that direction, but in future enhancement, viblyspace has good potential to full-fill schools requirement and student needs, all these things can be possible when it really make real impact in students life. Based on schools feedback it can be possible.

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