

Bridging the EdTech Divide: A Review of AI-Powered Tools for Underserved Learners in India

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Abstract

Inclusivity is something which is often ignored while development of AI tools which leads to restricted accessibility for those who lack resources. This causes many students to miss out on these useful tools which would otherwise help them immensely. In this research paper, I reviewed some of these tools, specifically Quizlet, Viamo and Quillbot, and identified their strengths as well as the areas which need improvement in terms of inclusivity and accessibility. This review led me to realise huge inclusivity barriers such as lack of multilanguage access and reliance on the internet. I proposed the incorporation of these features in the design of the AI tools so they could foster wider access for a larger number of users. Prioritising inclusivity can help bridge the large education divide which separates the haves from the have-nots while increasing opportunities for those who lack resources.

Keywords: *Inclusive education, AI tools, low-resource learners, educational equity, India*

I. Introduction

Education is a fundamental part of any individual's life. The persisting socioeconomic gap should not mean that the same gap extends to the education of the general population. For underprivileged students, these gaps present many challenges including dropping out of school, lack of literacy and a regular source of income. With advancements in technology, the integration of Artificial Intelligence (AI) in the education sector would be a major development, making learning more accessible and efficient. The tools would help provide personalised learning, identification of learning gaps and even mental support for diverse underprivileged communities. However, the mere availability of these tools is not enough. Despite their utility, these tools can not be considered inclusive due to various reasons. This paper aims to review the existing tools in order to propose design principles for building inclusive AI based learning tools in India. Even though AI is accessible for everyone, it still requires a working device, internet and fluency in reading and writing a language to operate.

II. Methodology

Existing Tools: Strengths and Gaps

Quizlet

Quizlet is an online tool that encourages students learning through several study features which include flashcards and game-based quizzes. Quizlet allows the user to design customized study sets or search for pre-made sets. Quizlet takes information and converts it into flashcards, quizzes, and games, so that users can study the same information in a variety of forms (Office of Teaching & Learning, n.d.). One of the major advantages of Quizlet is its cost-effectiveness. Students from underprivileged backgrounds who lack resources can use this platform for revision and self-learning.

Strengths of Quizlet

Digital flash cards

This is a Quizlet game mode where users are shown a card for each term. Clicking on the card allows the user to flip the card and see the definition of the term. The digital flash cards simplify the learning process by helping the student remember keywords and their definitions. The interactive interface converts a routine task like memorization into an engaging one. It encourages active recall which enhances long term retention. (Quizlet Inc., n.d.)

Match

Quizlet's Match is a study feature where students individually match terms and definitions from flashcard sets. These matching games help increase reading speed substantially while enabling the student to revise their material in an efficient manner. The games make revision seem like a challenge rather than a tedious task. (Quizlet Inc., n.d.).

Practice Electronic Assessment

Quizlet's customised practice electronic assessment lets the learner attempt timed tests which can be based on MCQs, subjective questions, true and false or even matching. Each question can be heard out loud, thus proving its accessibility for students with reading difficulties. This allows the student to identify their strengths and weaknesses in an efficient manner. (Quizlet Inc., n.d.).

Long-Term Learning Mode

Quizlet's long-term learning mode provides a recommended study set based on the number of questions the student answered correctly in the study set. The terms which were answered incorrectly are repeated frequently and the dashboard shows learning progress over time. The mode uses repetition concepts in order to encourage longer-term retention and mastery of the subject. (Quizlet Inc., n.d.).

Gaps in Quizlet

Quizlet is a widely used platform for revision and learning. It is freely available and can be accessed online with ease. Despite being accessible, Quizlet cannot be considered inclusive. Various factors including limited multilingual support and the requirement for stable internet connectivity hinder Quizlet's inclusivity.

Limited Multilingual Support

The core content of Quizlet is primarily available in English. This creates a language barrier for those users who are not fluent in English. Though Quizlet supports multiple languages, Hindi is the only Indian language among them. This limits access for students speaking other regional languages.

Requirement for a stable Internet connection

Quizlet can only be accessed through proper internet connectivity. This represents a major limitation for students in rural areas who do not have access to a stable internet connection. Consequently, the requirement hinders the students' access to this useful educational tool and highlights one of Quizlet's gaps which prevent it from being inclusive.

Viamo

Viamo is an international enterprise that encourages information and communication technology for development and mobile engagement. After collaboration with various organisations, Viamo engages with individuals through digital technologies (Devex, n.d.). Viamo ensures that learners can access the content in spite of their location through any digital means, making it an ideal tool for underprivileged learners. (Viamo, n.d.).

Strengths of Viamo

Viamo offers digital training that is particularly effective for reaching underserved learners. Its key strengths include:

Reaches Learners in Remote Locations

Viamo allows multiple people to develop professional skills through accessible education and training to learners present in any location, including rural areas. This geographically dispersed learning is one of the unique components of Viamo which allows learners to obtain information despite large distances. (Viamo, n.d.).

Supports Low-Literacy Users

Viamo provides underprivileged learners with a platform that allows for inclusive training. Furthermore, those with lower literacy skills can make use of Viamo in order to acquire information on a range of relevant topics. This is carried out via an Interactive Voice Response (IVR) platform (Viamo, n.d.).

Cost-Effective Delivery

Digital training helps reduce costs which are generally associated with in person training. The digital training can be attended through any available device with access to an internet connection. This makes Viamo ideal for those low-income learners who cannot afford to train in person. Thus, Viamo's cost effective delivery serves as an important feature which upholds inclusivity. (Viamo, n.d.).

Flexible Access

Viamo's flexible access enhances its utility immensely. Lessons are always available for the user. This means that even if a lesson is missed, the user can access it later on. The on-demand access highlights Viamo's efficient interface (Viamo, n.d.).

Gaps in Viamo

Limited Social Interaction

Digital training does provide accessibility but results in one main trade-off: social interaction. Interaction with peers and mentors is a fundamental part of training. Effective training is based on dialogue and learning in a collaborative manner. Such training cannot be imparted through online training on a digital platform. Thus, online training hinders the development of social skills as well as the user's ability to comprehend diverse perspectives.

Risk of Passive Learning

Online training might also encourage passive learning which can pose a major drawback for the learner. The learner might experience a lack of engagement with the material. Learning without the interactive components such as group discussions and immediate feedback might lead to the learner absorbing a lesser amount of information. Thus, this would undermine the purpose of the training.

Dependence on Internet and Mobile Infrastructure

Although Viamo is designed to function on basic mobile devices, its effectiveness still relies on consistent network availability. For learners in remote or under-resourced regions, poor connectivity can disrupt access to content and create barriers to continuity in learning. This is particularly concerning for underprivileged communities with limited access to digital infrastructure.

Quillbot

QuillBot is an AI-powered writing tool which allows the user to improve their text. Students and professionals utilize Quillbot for paraphrasing texts, correcting grammar or creating summaries of long passages. Quillbot uses natural language processing technology and offers tools which simplify the editing process by providing a structure to the writing in order to make it more efficient. (Teachfloor, n.d.)

Strengths of QuillBot

Multilingual Translation Support

Quillbot's Translate feature supports the translation of the text into multiple languages which also include regional Indian languages such as Hindi, Punjabi and Gujarati among many others. This functionality helps close the language barrier for the low-resource learners by reducing the dependence of the academic content on one single language. It allows the student to study the content in their preferred language, enhancing their understanding. This feature contributes to Quillbot's inclusivity for underprivileged learners.

Efficient Learning through Text Summarization

Quillbot's Summarizer helps produce concise and easy-to-read summaries for long passages. This assists the user in grasping the core idea of the information in a structured manner. This reduces the cognitive load on the learner and makes studying feel more manageable.

Grammar and Error Correction Tools

The platform's built-in grammar checker helps learners to recognize their spelling and grammar errors. This is particularly useful for students in rural areas, where English education may be limited. This tool can also help those students in improving English grammar gradually over time. It encourages language skill development and allows the learner to learn from their errors.

Gaps of QuillBot

Limitations in the Free Version

Quillbot's free version restricts the user to limited features. In order to access all features including the advanced ones, the learner must use the paid premium version which is not feasible for students belonging to low income households. Thus, this limits Quillbot's accessibility for such students and reduces the platform's overall utility.

Inconsistent Output Quality

Students belonging to underprivileged backgrounds who rely heavily on this tool might face use of incorrect language. Though Quillbot is a useful tool for paraphrasing and grammar correction, it also produces results which do not sound natural. For students without a mentor, this might result in misguidance and confusion.

Challenges for Low-Resource Students

Language Barrier

Language presents a major obstacle for underprivileged learners residing in rural areas. The lack of fluency in English prevents these students from utilizing tools which would otherwise provide them with educational support. This limitation leads to missed learning opportunities due to the language requirement. At times, this struggle causes students to drop out of school due to the students falling behind because of language.

Lack of resources

Limited resources present a major challenge for the underprivileged learners. The absence of textbooks as well as the lack of online resources cause the learners to fall behind in the curriculum. The students are unable to gain proper exposure to the subjects they learn. This prevents them from exploring subjects that might interest them. Lack of resources also reduces the learners' familiarity with English which further establishes a language barrier. Furthermore, the learner develops an inability to grasp any future learning opportunity.

Financial Constraints

Financial constraints are the hurdles that prevent learners belonging to low income families from obtaining an equitable education. Continuing education beyond a basic level may present an obstacle for such learners. Thus, the students are forced to drop out of school early and begin contributing to the household income from an early age. The economic barrier hinders their development and does not allow the learners to even access learning material. In many cases, students often lack the basic digital resources required to study from an online platform.

Design Principles for Inclusive AI Tools

Language Accessibility

Integrating support for various languages, especially regional Indian languages, can be considered a significant step towards inclusivity. This feature, if implemented, would simplify the use of AI tools for underprivileged learners. This would enable the learners to engage with the learning content to its full extent. The language barrier would not prevent the students from understanding the material. As a result, AI tools would become more accessible and learners would not have to drop out of schools due to problems with language.

Text-to-Audio Feature

This feature would be of immense help to those learners who may be able to speak a language but might not understand the language in a written form. The Text-to-Audio feature would decrease the level of skill required to operate AI educational tools, thus factoring in inclusivity for such learners. This functionality would also encourage better comprehension of the learning material by the learner and take into account the diverse learning needs of different students.

Reduction of Reliance on Internet Access

Designs of AI tools which incorporate features that can be accessed without the internet can be of great benefit to those learners residing in a rural area without stable internet connectivity. If these features can be accessed without the requirement of an active internet connection, learners would be exposed to guidance and support which they would otherwise not be able to access. This would ensure the learners are able to take advantage of this facility even in low resource environments without being dependent on availability of internet.

Guidance and Career Counselling

The integration of career counselling with AI tools can provide crucial support to learners in rural areas. These students are unable to receive support at home due to lack of exposure. This causes the students to miss out on career counselling and guidance which other financially sound students receive. This contributes to widening the existing socioeconomic gap and the absence of direction can be confusing for the student. Structured guidance through these tools can allow the students to make informed decisions for their future.

Edu Buddy: A Case Study in Inclusive AI Design

EduBuddy is an AI-powered educational tool I developed for the underprivileged students I teach. It provides chapter summaries, multiple-choice questions, subjective test prompts, and a doubt-solving feature, each of which involves AI. I created EduBuddy as a free online platform after observing major learning gaps among my students and identifying the need for accessible online support.

Through my experience of creating Edubuddy, I realised that even Edubuddy could not be considered truly inclusive. This was due to Edubuddy's lack of multilingual support as well as its dependence on internet connectivity, both of which limit user accessibility for learners belonging to low-resource backgrounds. Additionally, my tool also requires a certain level of fluency in English to operate. This led me to recognize that the gaps in my tool were similar to those I had observed in the online AI powered platforms I had reviewed such as Viamo and Quizlet. Despite being designed for a better learning experience, such tools often tend to overlook these inclusive features.

Moving forward, I plan on integrating inclusive features in future designs of Edubuddy, which would include support for regional languages as well as offline accessibility. I meant to create Edubuddy not just as an educational tool for my students but also as a contribution towards weakening the education barrier which exists for many students all over India.

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III. Conclusion

Lack of inclusive features in AI tools presents a major challenge for accessibility for underprivileged learners with limited resources. This leads to less exposure for these students. As a result, they are unable to use useful educational tools. I reviewed such existing tools in this research paper and highlighted areas where inclusive features should be present. I identified certain pointers which hindered accessibility for the underprivileged learners.

My tool, Edubuddy, which I had created for the benefit of underprivileged learners had gaps such as internet dependency and a lack of multilingual support that prevented my tool from being considered inclusive. This realization motivated this research paper and I decided to review other widely used platforms to analyse if they had a similar lack of accessibility.

Inclusivity is a must for these tools if they are to reach a wider audience. It needs to be incorporated in these tools so it can benefit the learners who lack resources. To bridge the digital divide in India, AI tools which take inclusivity into consideration need to be developed so they address this problem of inaccessibility and with such developments, awareness and progress are sure to follow.

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