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Review of Open AI Tools supporting higher education - Tools available on GitHub



Abstract

OpenAI tools foster innovative approaches to education, allowing for the automation of routine tasks, adaptive learning experiences, and creative content creation. By integrating OpenAI's models into educational platforms, educators can offer tailored support to each student, encourage interactive learning, and increase efficiency in educational processes. The result is a dynamic and inclusive learning ecosystem, where AI-driven tools empower educators and enhance students' learning experiences across all educational levels. The study analyses OpenAI tools for education support, available on GitHub. The focus is to assess different functionalities and features that support educational functions such as generation of quiz, questions, summarization of contents etc. and results of the analysis are presented in a tabular format.

Keywords: Open AI tools, GitHub, AI for education

A. Introduction:

While the question of whether AI will ultimately surpass human capabilities remains open to debate, it's clear that AI has already made a strong impact on the tech and startup landscape—not only in our country but globally. Artificial Intelligence (AI) has become a pivotal force in driving technological innovation, transforming sectors like healthcare, finance, and transportation, among others. Statista projects that global revenue from the AI software market will reach \$126 billion by 2025. Additionally, Gartner reports that 37% of organizations have adopted some form of AI, highlighting not only the rising acceptance of AI technology but also its deeper integration into business operations. Over the last four years, AI adoption among enterprises has increased by 270%. Furthermore, Servion Global Solutions estimates that by 2025, AI will power 95% of customer interactions. In 2020, Statista also reported that the global AI software market was anticipated to grow by approximately 54% annually, reaching a forecasted value of \$22.6 billion.

The market size is expected to show an annual growth rate (CAGR 2024-2030) of 28.46%, resulting in a market volume of US\$826.70bn by 2030. In global comparison, the largest market size will be in the United States (US\$50.16bn in 2024). (<https://www.statista.com/outlook/tmo/artificial-intelligence/worldwide#:~:text=Artificial%20Intelligence%20%2D%20Worldwide&text=The%20market%20size%20is%20expected,US%2450.16bn%20in%202024>).

While there is an expanding body of literature on AI development, few comprehensive reviews systematically analyze utility of OpenAI tools for the education purpose. This gap highlights the need for a thorough review that synthesizes knowledge from diverse sources and provides a unified perspective on OpenAI tools and their application in education sector.

Just like the open-source operating systems, databases, IDEs have come to market and have not only created their own position but also are ruling the market. Question arises, whether open-source AI tools will also follow this pattern. In-depth investigation is required to understand the growth of open-source AI tools in the software industry, and whether these tools will have the same acceptability as that of other open-source softwares.

The research work under consideration, seeks to address the gap by conducting a systematic review of the AI tools available on GitHub, especially the ones which are meant for assisting education field. The researcher, being in the field of education for more than 2 decades, and a strong supporter of open-source softwares, is keen on understanding and analyzing role of open-source AI tools, being used in the field of education.

B. Literature review

1. In his 2008 research paper, "A Literature Review on Artificial Intelligence," published in the International Journal of Information and Management Sciences (Vol. 19, Issue 4, pp. 535-570), Ayoola Oke provides a comprehensive, well-crafted overview of advancements in artificial intelligence (AI). The paper presents a detailed review of recent developments in AI and its applications, offering valuable insights for both newcomers and experienced researchers in the field. This work not only highlights the state-of-the-art in AI but also serves as a resource to revisit familiar issues and gain perspective on ongoing advancements.

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2 In their January 2015 paper, "Artificial Intelligence Applied to Project Success: A Literature Review," published in the International Journal of Interactive Multimedia and Artificial Intelligence (Vol. 3, Issue 5, pp. 77-84 Viewed on 5th July 2025), authors Daniel Magaña and Juan Carlos Fernández Rodríguez analyze the role of AI in achieving project success. The study concludes that critical success factors include the use of Neural Networks, Fuzzy Cognitive Maps, Genetic Algorithms, and Bayesian Models. These AI techniques are identified as essential tools for enhancing project outcomes and supporting decision-making processes.

3 (<https://www.igauge.in/blog/detail/ai-education-in-india-six-transformative-ways-technology-is-shaping-learning/159#:~:text=By%20automating%20the%20content%20creation,student%20needs%20and>

%20learning%20styles. 5th Nov 2024). After reviewing the contents available on the webpage, it can be inferred that most of AI tools in the field of Education target 6 major areas – personalized learning, intelligent tutoring system, adaptive assessment, virtual classrooms, content creation and predictive analytics.

4 (<https://openai.com/index/teaching-with-ai/> 2nd Nov 2024- August 31, 2023) An article titled "Teaching with AI" available on the URL, discusses use of a generative AI tool for generating conversation for role plays, build quizzes, tests, lesson plans and inculcating critical thinking amongst students.

5 As can be seen in the image available on (<https://appinventiv.com/blog/artificial-intelligence-in-education/>), main focus areas of AI in education field have positive impact on educational processes, hindered outcomes, but some are of the opinion that it hinders educational outcomes. Others have opined that AI tools in education field have wither no impact or are of no use.

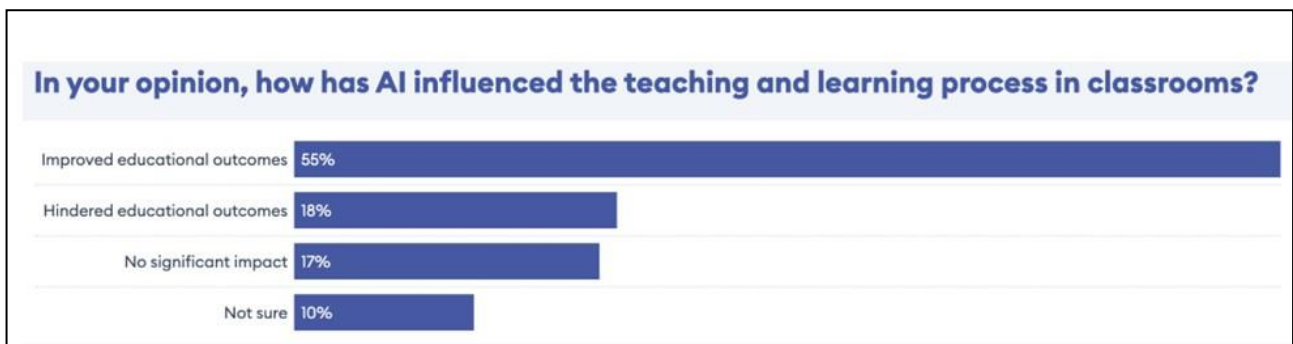


Figure 1: Use of AI in educational institutions – Survey

6 (<https://www.moesif.com/blog/technical/api-development/Open-Source-AI/>) in the article available on this URL, Open-source AI fosters transparency, collaboration, and accelerated development, driven by major contributors like Meta, Amazon, and NVIDIA. Its advantages make open-source AI increasingly appealing across industries, offering cost savings, enhanced security through transparency, and strong community support.

Widely-used open-source AI tools, such as TensorFlow, PyTorch, Keras, and Apache MXNet, power applications in fields like healthcare, finance, and retail. However, integrating and maintaining these tools can present certain challenges.

7 Computers and Education: Artificial Intelligence, Volume 2, 2021, 100025, AI technologies for education: Recent research & future directions, Author links open overlay panel, Ke Zhang a, Ayse Begum Aslan b in their paper have studied use of AI in educational institutions. This article provides a comprehensive review of selected empirical studies on artificial intelligence in education (AIEd) from 1993 to 2020, sourced from the Web of Sciences database and specialized AIEd journals. A total of 40 empirical studies met the selection criteria and were analyzed using various methods, including bibliometrics, content analysis, and categorical meta-trends. The article assesses the current state of AIEd research, highlights notable AIEd technologies and applications, examines their established and potential educational benefits, and explores the intersection of AI innovations with educational practices. It offers practical insights for both technology developers and educators driving AI in education, along with in-depth discussions on the practical implications and future research directions. The progress of AIEd emphasizes the need for initiatives addressing AI ethics and privacy, supported by interdisciplinary collaboration in large-scale, longitudinal research and development.

8 (Creative Use of OpenAI in Education: Case Studies from Game Development by Fiona French, David Levi, Csaba Maczo, Aiste Simonaityte et.al. School of Computing and Digital Media, London Metropolitan University, London N7 8DB, UK,

(Interact. 2023, 7(8), 81; <https://doi.org/10.3390/mti7080081>, Submission received: 20 July 2023 / Revised: 10 August 2023 / Accepted: 16 August 2023 / Published: 18 August 2023) A case based research is vocal about use of different open AI tools for the benefit of educational organization and students. According to these authors, Educators and students are increasingly interested in using generative artificial intelligence (AI) technologies to enhance learning outcomes by providing personalized experiences, round-the-clock conversational support, text editing, and problem-solving assistance. This article reviews current perspectives on the role of AI in education and shares recent research conducted with undergraduate students. Specifically, we describe our integration of OpenAI tools, ChatGPT and DALL-E, into the curriculum during the 2022–2023 academic year.

A cohort of games programming students from the School of Computing and Digital Media at London Metropolitan

University was assigned a research and development project requiring them to engage with OpenAI tools. Their task was to assess the use of these tools in game development, create a functional solution, and report their findings. We present five case studies featuring student outputs and analyze their work. This assessment approach was both productive and well-received, aligning with students' interests and enhancing skills in programming, problem-solving, critical reflection, and exploratory design.

9. (Artificial intelligence in higher education: the state of the field, Helen Crompton & Diane Burke International Journal of Educational Technology in Higher Education volume 20, Article number: 22 (2023))

This systematic review presents unique insights and an up-to-date analysis of artificial intelligence (AI) in higher education (HE) from 2016 to 2022. Following PRISMA principles and protocol, 138 articles were identified for comprehensive examination. Using both a priori and grounded coding, data from these articles were extracted, analyzed, and categorized. The findings reveal a surge in publications in 2021 and 2022, with output nearly doubling or tripling compared to previous years, indicating emerging trends in AIED for HE. Research was conducted across six continents, with China surpassing the U.S. as the leader in publications. A notable shift also occurred in researcher affiliation, with education departments now the most prevalent, addressing the prior gap in representation from this field. Undergraduate students, comprising 72% of the study focus, were the most commonly researched group, while language learning—covering areas like writing, reading, and vocabulary acquisition—remained the most frequent subject domain. The AIED applications targeted primarily students (72%), with 17% aimed at instructors and 11% at managers. Grounded coding identified five key usage categories for AIED in HE: (1) Assessment/Evaluation, (2) Predicting, (3) AI Assistants, (4) Intelligent Tutoring Systems (ITS), and (5) Student Learning Management. This review highlights existing gaps in AIED research, providing a foundation for future studies, including the exploration of emerging tools such as ChatGPT.

C. Rationale behind the research study

Educational institutions are swiftly inclining towards remote education, where different IT based tools can come handy. Such tools can significantly reduce the cost of educational services, further boosting the efficiency as well. The Open AI tools listed on GitHub are available in public domain and hence easily available for research work. Such decrease in cost of educational services, can further benefit the learners. Considering above parameters, the researcher decided to review eight OpenAI tools available on GitHub for the purpose of the study.

D. Research design of the study under consideration

The main objective of the study remains to understand and analyze the role and impact of open AI tools in the field of higher education.

D.1. Research gaps

After going through some research articles, papers and web contents, the researcher could identify some gaps, which need to be addressed for more effective use of such tools for facilitating the teaching-learning in higher education institutions.

The researcher arrived at following issues:

- a. There has been no study that addresses use of open AI in the field of higher education
- b. There has still been confusion about the exact function in educational institutions which can be replaced / supported by OpenAI tools.
- c. Acquaintance of teachers with Open AI tools for the use of different functions in the higher education arena is still an issue needs to be dealt with

Taking into consideration above gaps, the researcher identified following research questions:

D.2. Research Questions

Identifying the right research questions can be a deciding factor in a research study. To better steer the study under consideration, the researcher posed following questions:

- a. What are education related functions that can be better taken care by Open AI tools available on GitHub?
- b. Which improvements are needed in OpenAI tools to better fit and better alignment with academic functions?

D.3. Objectives

Objectives can help in defining the scope and depth of a research study, wherein one can avoid extraneous research and ensure that the research methods and conclusions can be readily assessed. Objectives also enhance the research design; by understanding the objectives, one can determine which methods are most suitable for the study. Such well-defined objectives also demonstrate how a research work will add to existing body of knowledge.

- a. To understand the nature and scope of OpenAI tools available on GitHub
- b. To analyze different functionalities of OpenAI tools for education purpose
- c. To compare various OpenAI tools listed on GitHub, to understand their fitness for academic processes.
- d. To identify areas of improvement in Open AI tools available on GitHub

D.4. Sampling

Sampling remains one of the critical areas in a research study. Right technique and sample size can make or break

success of the research study.

For the study under consideration, the researcher decided to choose purposive sampling, the OpenAI tools available are available in public domain and can be well explored for the research work. In purposive sampling, the selection of samples relies solely on the researcher's expertise. Since their knowledge is crucial for forming the samples, this method can yield highly accurate results with minimal margin for error. This technique is also referred to as judgmental sampling or authoritative sampling. Following are the tools which are targeted for analysis purpose. All these tools are categorized under "Education Assistant" tools.

1. ELI5
2. LiveReacting AI
3. Yip
4. Caktus
5. MindSmith
6. Scholarcy
7. TutorAI
8. Quizgecko

E. Data Collection

Achieving the objectives and answer the research questions, is totally based on the data collected. The researcher browsed through the websites for each OpenAI tool to gather some descriptions of the tools, which are mentioned below:

i. ELI5 – Explain Like I'm Five (ELI5) is an AI-based learning tool that makes complicated topics easier to understand by using simple language. It uses an AI model developed by OpenAI to take any question and explain it at different levels, avoiding any confusing technical terms. It is a tool that simplifies the complex topics. The tool takes care of different levels of learners and allows them to choose the category based on their current knowledge. The tool is quite affordable. The tool delivers a tailored learning experience for users, making it an effective way to acquire knowledge. ELI allows for easy access to information without the significant cost associated with hiring a personal tutor.

ii. LiveReactingAI - LiveReacting makes it happen. Regardless of the industry it is being applied for, an AI host quickly grasps the context of the live show and operates like a professional.

The host introduces the quiz, reads the questions along with possible answers, discusses the topic while users respond, announces the winners for each round, and engages with participants in real time. With LiveReacting, one does not have to worry about being on camera—the AI host will independently keep the live show entertaining, enjoyable, and contemporary.

The tool works equally well for educational institution, an influencer promoting a product, or a small pub owner who enjoys hosting quizzes, LiveReacting is here to support the learners. The tool has multilingual support.

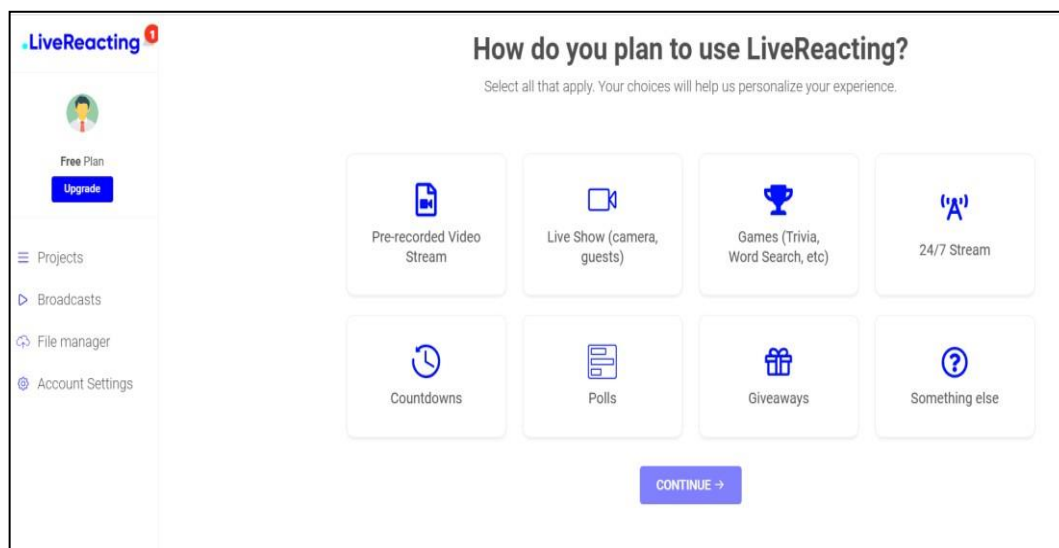


Figure 2: Home screen of LiveReactingAI after login

iii. Yip – This tool Automatically creates multiple-choice, true/false, or fill-in-the-blank quizzes using our AI-powered question generator. It also allows Review and customize the generated quiz, then easily export them to test or share with others. Free version of the tool is available along with nominally charged paid version. There is no limit on number of questions to be generated. Hence it is well suited for large number of learners.

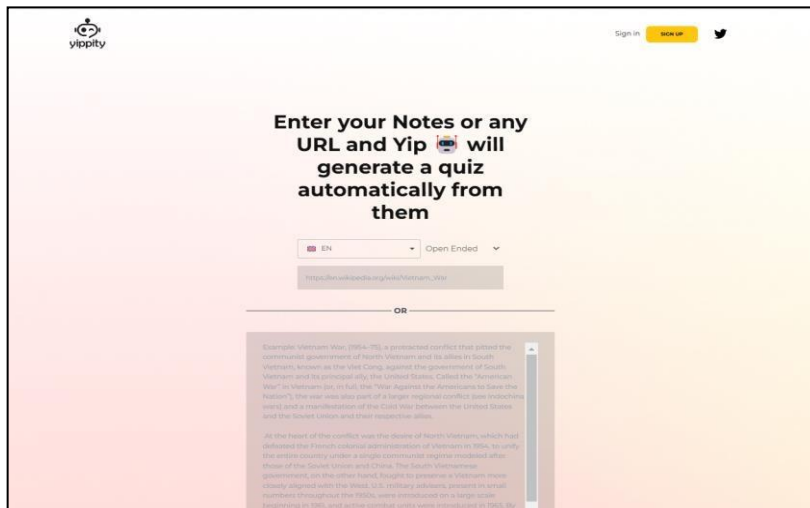


Figure 3: Home screen of Yip after login

iv. Caktus – Caktus is a homework helper that can generate essays, generate stories, generate paragraphs, question solver, sentence expansion and humanizes text. Apart from such academic content generations, Caktus also generates summaries for LinkedIn and concludes writing.

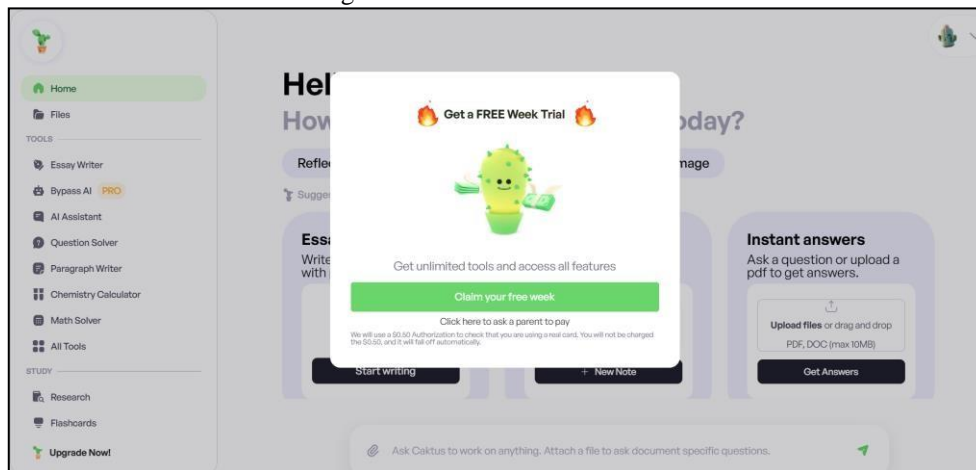


Figure 4: Home screen of Caktus after login

v. Mindsmith - Mindsmith is a next-generation eLearning authoring tool that leverages generative AI to simplify and expedite the process of creating and sharing learning content. The tool can generate lessons, customize the contents, this also updated the LMS. The tool supports multimedia contents and most importantly allows export of the contents to other platforms. It helps to generate new versions of the lesson in any language supported by Google Translate or DeepL. These versions are tracked collectively for analytics purposes. Free version is available for the beginners.

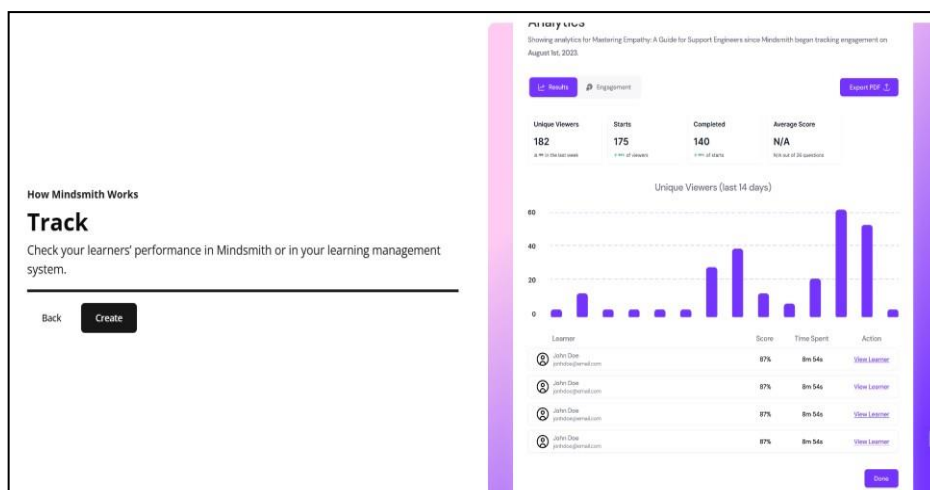


Figure 5: Home screen of Mindsmith after login

vi. Scholarcy – A tool that supports students for learning as well as researchers. Scholarcy allows you to summarize any paper, article, or textbook, and even videos! It transforms lengthy, complex texts into interactive summary flashcards that emphasize key information. It allows to import any file from any source. Whether one is viewing articles online, have a downloaded chapter, or possess a folder filled with PDFs and Word documents, it is possible to easily bring them in. It allows Smart highlighting and analysis features direct the user to crucial sections of text and assist in understanding them better. Scholarcy is an ideal tool for saving, organizing, and quickly refreshing your reading materials. Over and above all these features, it helps to export your flashcards in various file formats that are compatible with numerous research and productivity applications.

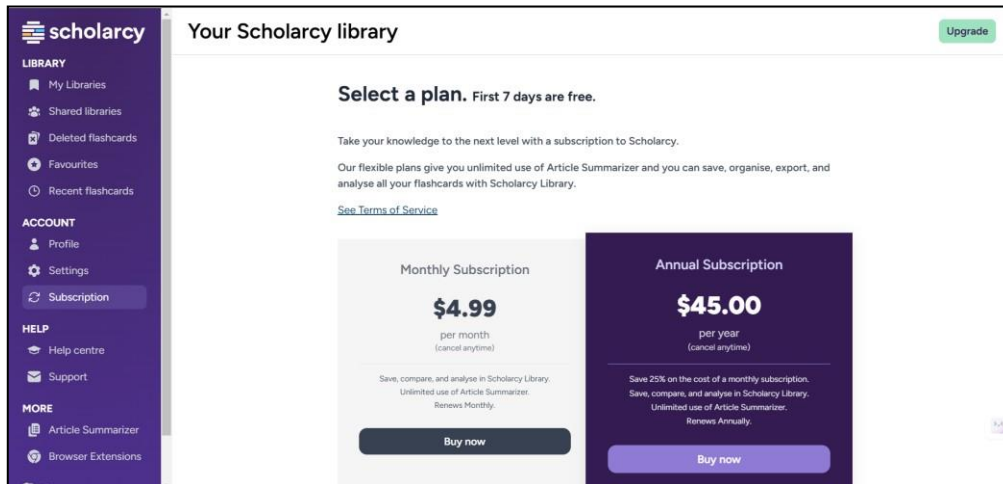


Figure 6: Home screen of Scholarcy after login

vii. TutorAI - Develops a personalized learning pathway to enhance your achievements in school, work, and everyday life. It has two options – one for learners and another for teachers. Given a topic, it can generate contents for the same. Contents are generated module-wise and learners can walk through them at own pace. Though the user interface is not very catchy and lacks aesthetic aspects.

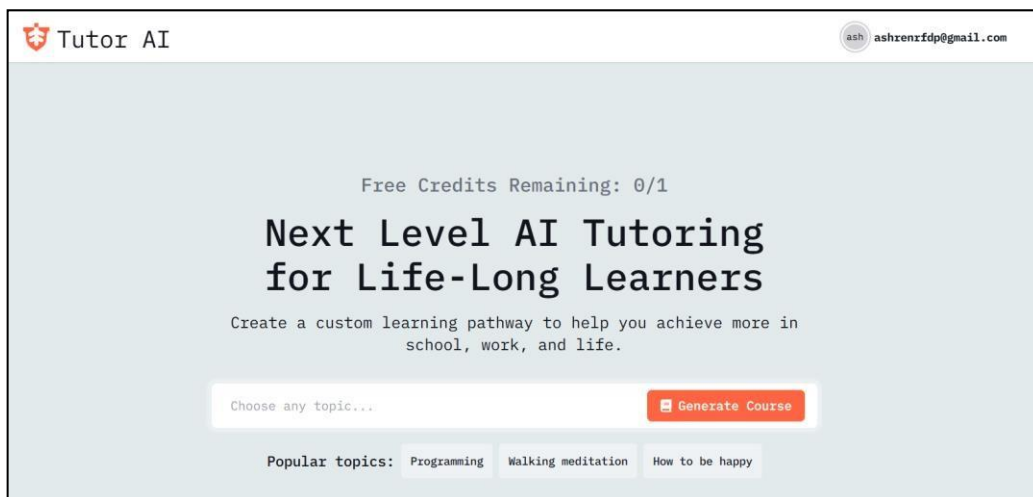


Figure 7: Home screen of TutorAI after login

viii. Quizgecko – The tool is used for generating quiz questions, flashcards, and answers with AI from any documents. Or ask for help with any question one has. The questions can be generated from pdf, word or even PowerPoint presentations. This tool basically assists a self-learner to prepare for the exams based on the study material that is available. Objective as well subjective questions can be generated with this tool. Our AI grades short answer and essay questions, providing accurate scores and helpful feedback to enhance the learning. Progress on learning can also be tracked by the tool and after taking into account performance, review frequency, and question difficulty of the learner. Free trial of the tool is not available for the beginners. API is available to export questions to other LMS tools

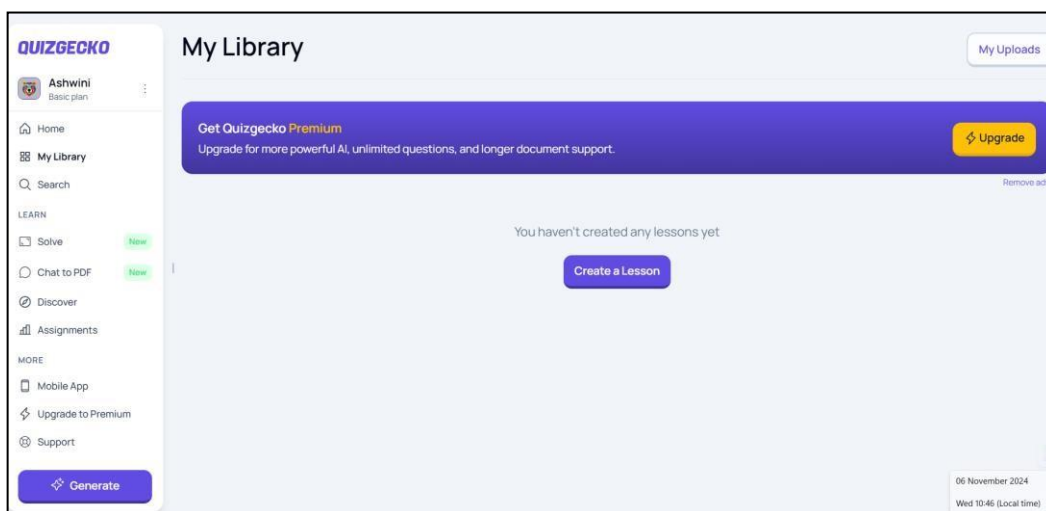


Figure 8: Home screen of Quizgecko after login

F. Analysis and Conclusions

a. Analysis of the data gathered

The researcher gathered the details about OpenAI tools from the respective website. Also, logins were created for all these tools to have understanding about different functionalities and features. The observations are noted down in tabular format. Qualitative analysis was done based on the observations noted down to identify unique features of the tools as well as missing functionalities.

The researcher analyzed the tools listed in the section D.4, to generate following data points.

Sr No	Name of the tool	Quiz generation	Export / Import contents	Summarization	Multilingual support	Multimedia support	Generate answers	UI (1-5, 1 Best)	Free version	Other
1	EL15	Problem signing up (Also the link from GitHub was note connected to the tool website)								
2	LiverReactingAI	Yes	Yes		Yes	Yes	Yes	4	Yes	
3	Yip	Yes	Yes					2	Yes	Web contents
4	Caktus			Yes			Yes	2	Yes	
5	MindSmith		Yes		Yes	Yes		3	Yes	
6	Scholarcy			Yes				2	No	Research
7	TutorAI	Yes						5	Basic	
8	Quizgecko	Yes	Yes				Yes	3	Yes	Flashcards

Table 1: Summary of analysis of OpenAI tools available on GitHub (Education Support)

b. Areas for improvement

- Most of the above tools, though tagged under ‘Open Source’ category, have some nominal charges per month, but these are affordable.
- User interface is a big issue in all most all the tools, which may result into inefficient use of the tools for the purpose they are developed for.
- Very few all-purpose tools are available which include all the functionalities and most of them focus on specific area such as only generation of quiz or only summarization of the contents etc.
- Compatibility with other platforms for import and export of the contents is still an issue and needs lot of attention.

G. Conclusion

OpenAI provides a variety of tools and models that can support education in unique ways, enhancing learning experiences and helping educators create engaging, adaptive, and personalized content. Better user interface, further alignment with education functions can really boost teaching-learning process, to benefit the learners.

H. Future scope

Generative AI holds great promise for enhancing the entire educational ecosystem, including students, teachers, and parents. However, implementing and monitoring this technology comes with challenges. In a diverse country like India, where cultural and social differences create barriers to equality, generative AI can help bridge gaps, offering tailored support to various educational stakeholders.

Recognizing the importance of AI literacy, the CBSE has integrated AI as a skill module in classes 6–8 and as a skill subject in classes 9–12. Additionally, many organizations are developing AI- powered virtual assistants to support learning for students, teachers, and parents across a range of educational contexts.

Here are a few ways generative AI can be beneficial:

1. **Supporting Parents in Literacy Activities:** Virtual assistants can help parents identify activities to improve their child’s reading and comprehension skills. For instance, parents could use AI- generated stories to read to their child or encourage the child to read aloud, which can be especially valuable for parents who are themselves not literate but want to participate in their child’s education.

2. **Helping Teachers Plan Engaging Lessons:** Generative AI can assist teachers by suggesting classroom activities that align with prescribed educational guidelines. A virtual assistant can save teachers time by sourcing ideas from curated documents and expert recommendations, enabling them to plan unique and engaging lessons without extensive preparation.

3. **Personalized Learning for Young Children:** With guidance from a teacher, parent, or community member, generative AI can adapt to a child’s learning pace and style, making it particularly useful in early childhood education. This technology can support foundational literacy, numeracy, and language skills in a way that meets each child’s individual needs.

Generative AI offers a powerful tool for personalized, inclusive, and efficient education, providing new opportunities for learning across different age groups and backgrounds.

Considering all above facts, more in-depth and expansive study is required about Open AI tools available for supporting education related functions. Such future studies can include better mapping of tools for mundane tasks related to the field of education. Also, there can be focus on checking usability of such tools

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