

Pictorial Step-By-Step Exploration of ‘Open Knowledge Maps’: The Free AI Tool to Get Categorized Academic Reviews

Dr. K. Ramasamy

College Librarian, M.V. Muthiah Government Arts College for Women, Dindigul

Email: ramasamymay1975@gmail.com

Introduction

The Artificial intelligence is revolutionizing the way the researchers think, conceive, carry out and complete their research activities. Starting from choosing the title, collecting the reviews, framing the methodologies, selecting the sample, writing the content, correcting the content, paraphrasing the content, analyzing the data, visualizing the data, suggesting new areas and formatting the references, AI tools have come into the picture. Both commercial and free versions of various AI tools are available to the research community. AI tool aggregators like topai.tools list hundreds of AI tools for research work.

We have AI tools for conducting surveys, interviews in multiple languages, setting alerts, extract and summarize research papers, generate citations, analyze data, review the related literature, digest and generate feedback on various sections of research papers, categorize the scholarly content, provide chat-like interface, create mindmaps and flowcharts, build storyboards, create images and images based on description, answer simple to complex questions etc. We have to select the right AI tools for right purpose. We have to know and understand the limitations of the proposed AI tool in terms of our work perspective. Our critical thinking and creative ideas should always go with the use of these AI tools. The present chapter talks about the use of one such free AI tool namely ‘Open Knowledge Maps’.

Review of Literature

AI tools have been used by the faculty members, researchers, research scholars, students and all members of the academic for teaching, learning and research purposes.

The increasing involvement of AI in the writing, creation, and overall production of research papers has gained significant attention within the research and academic communities, and health organizations over the past year (Li et al., 2023; Alia et al. 2023)

The study also found that ChatGPT can be used to generate topics for essays, which could make it easier for students to find topics they are familiar with and can write about (Tangermann, 2023; Ventayen, 2023).

ChatGPT and other LLM models offer numerous possibilities, such as condensing lengthy articles or generating initial versions of presentations that can be refined later. In addition, they have the potential to assist researchers, students, and educators in brainstorming ideas (Roose, 2023).

The qualitative researchers are increasingly using AI for a variety of research tasks, which has fundamentally altered the research process. AI in various forms can be a useful means and tool for advancing our knowledge and contributing to theory development (Christou, 2023).

AI also assists academicians, researchers, and students with content generation, analytical calculation, and writing, including thesis preparation and publishing research articles in academic journals. AI assists academicians and students in developing better content, illustrations, grammar, and spelling and refines the word choice and style of the research paper. AI uses Natural language to analyze texts and provides recommendations to strengthen the arguments in the research papers. AI tools help to search the relevant research areas, and topics, identify key concepts and research gaps, generate literature review, and generate citations and bibliographies in the desired citation style. AI aids in research and knowledge management. AI helps in analyzing complex data (Monika et al., 2023).

Artificial Intelligence (AI) has revolutionized the field of education and research by providing new and innovative tools that can help academia and researchers in various ways. AI-based tools offer many benefits such as personalization, automation, accuracy, and efficiency. AI-based tools have the potential to transform education and research by providing new and innovative ways to learn and research. AI-based research utility tools have the best features for ease of time and efforts for researchers and technical communication but they have come with

equal potential negative effects as well, that are harmful to science and technology (Bankar and Lihitkar, 2023).

While AI-based technologies can streamline routine research processes, they also risk contaminating the scientific research landscape and undermining the credibility of authentic works produced by other authors. Nevertheless, it is important to recognize that integrating AI in research should aid rather than replace human creativity (Chubb, Cowling & Reed, 2022).

Researchers now have access to new avenues for investigating complex phenomena and generating valuable insights thanks to the ability of AI to divulge useful information that can be used to build theoretical discussions and analyze and interpret large volumes of information (Borges et al., 2021; Hwang et al., 2020; Xu et al., 2021).

AI models can review draft theses and provide feedback on literature gaps, evaluate if research questions and claims are properly supported by evidence, ensure logical flow and transitions, and highlight areas needing revision or lacking citation (Allen et al., 2020).

AI tools for Research

Though the list is very long, a handful of tools used by most of the academia are given below:

- **Semantic Scholar**
- **Scite.ai**
- **Research Rabbit**
- **PaperPal**
- **SciSpace**
- **Scholarcy**
- **Jenni AI**
- **Elicit**
- **Consensus**
- **ChatPDF**
- **Typeset.io**
- **EvidenceHunt**
- **Grammarly**
- **Quillbot**
- **Trinka**
- **OpenAI**
- **OpenRead**
- **Humata AI**
- **Tutor.AI**
- **Perplexity AI**

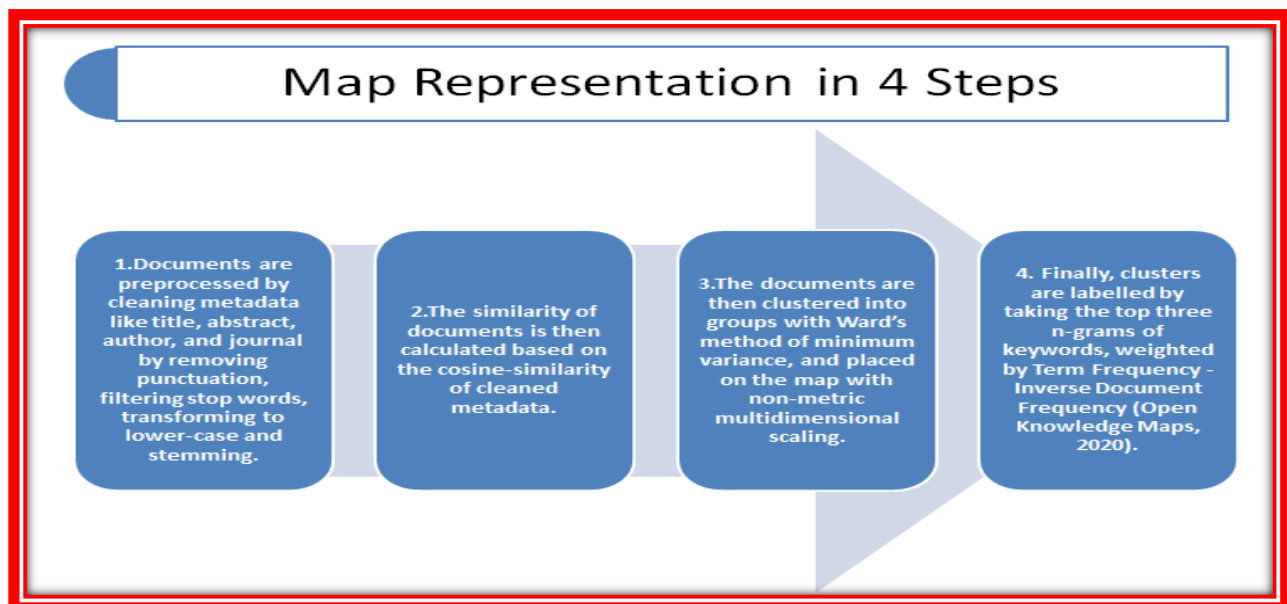
Open Knowledge Maps

Open Knowledge Maps is the largest visual search engine for research in the world. On <https://openknowledgemaps.org>, users can create knowledge maps of research topics in any

discipline. Knowledge maps provide an instant overview of a topic by showing the main areas at a glance, with relevant papers and concepts attached to each area (Open Knowledge Maps, 2020).

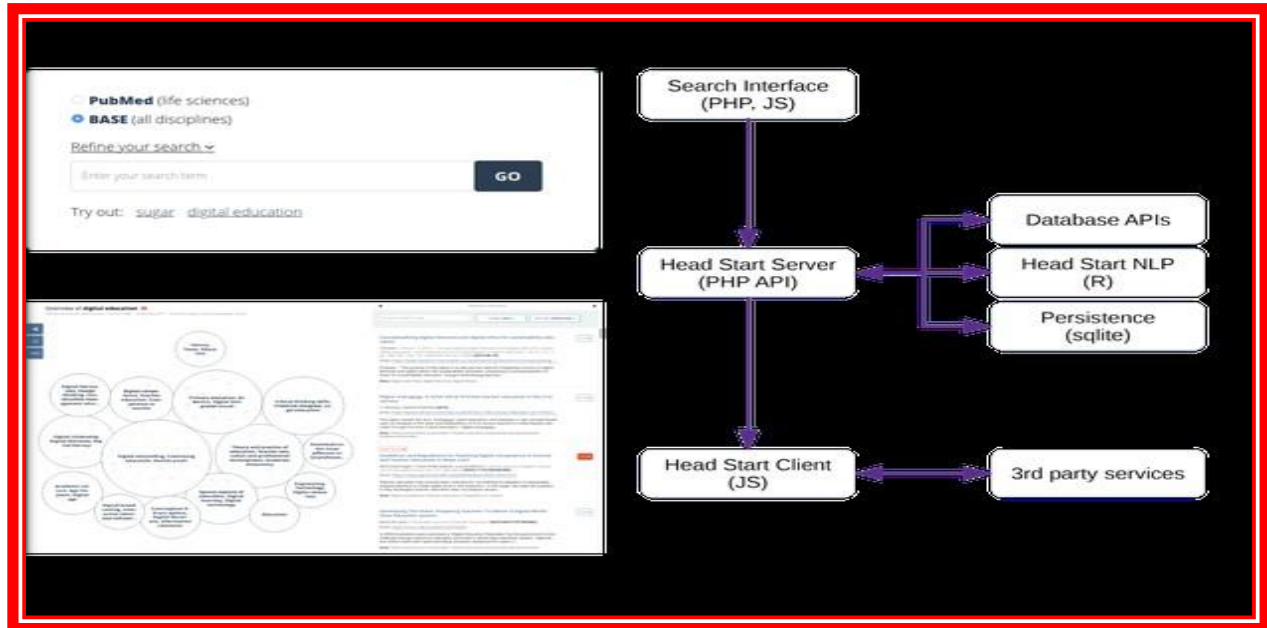
Head Start, the underlying software library, is an open-source knowledge mapping framework developed by the Open Knowledge Maps team. Head Start provides an interactive, web-based interface and comes with a backend that is capable of automatically producing knowledge maps from a variety of data, including text, metadata and references. Since 2016, we integrated a range of data sources from the Open Science ecosystem (BASE, PubMed, OpenAIRE, DOAJ, and PLOS) and created customized adaptations for diverse user requirements (our web service, VIPER, CRIS Vis, LinkedCat+).

Head Start follows a client-server architecture with a user-facing search interface and map frontend based on JavaScript, a service and API layer based on Apache/PHP, a natural language processing/machine learning backend based on R, and an SQLite database for the persistence of map representations. To create a knowledge map, we first retrieve the metadata of a set of documents from the respective database (e.g. the most relevant documents for a search term). Then, we compute the map representation in four steps:



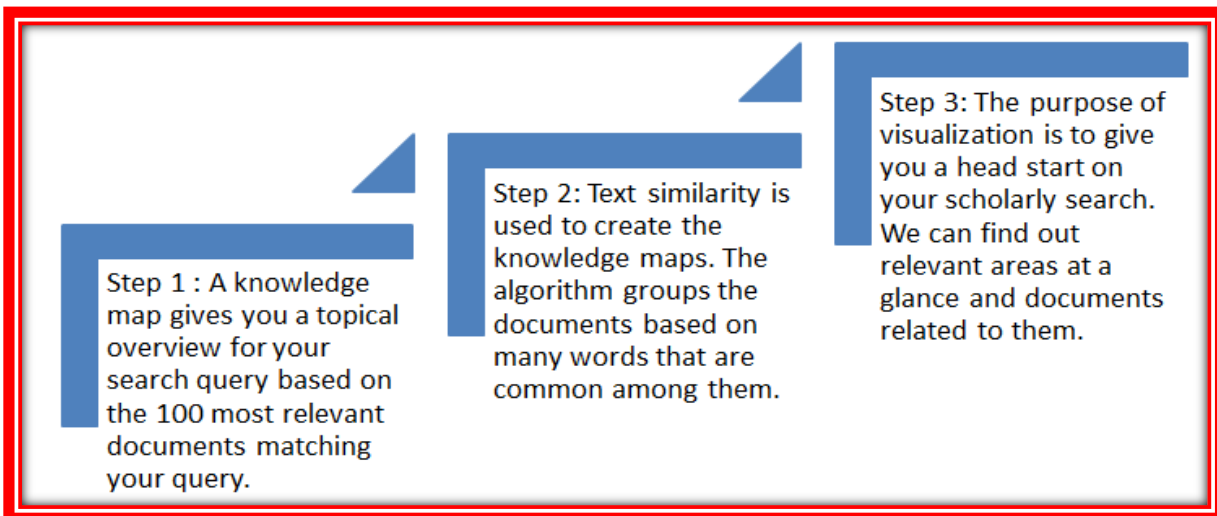
OKM Architecture

The Head Start Architecture shows how openknowledgemaps work. We enter the search terms in the Search Interface. The server searches for the terms using Database APIs, Head Start Natural Language Processing and SQLITE query. The results are delivered in a unique style to the Head Start Client.

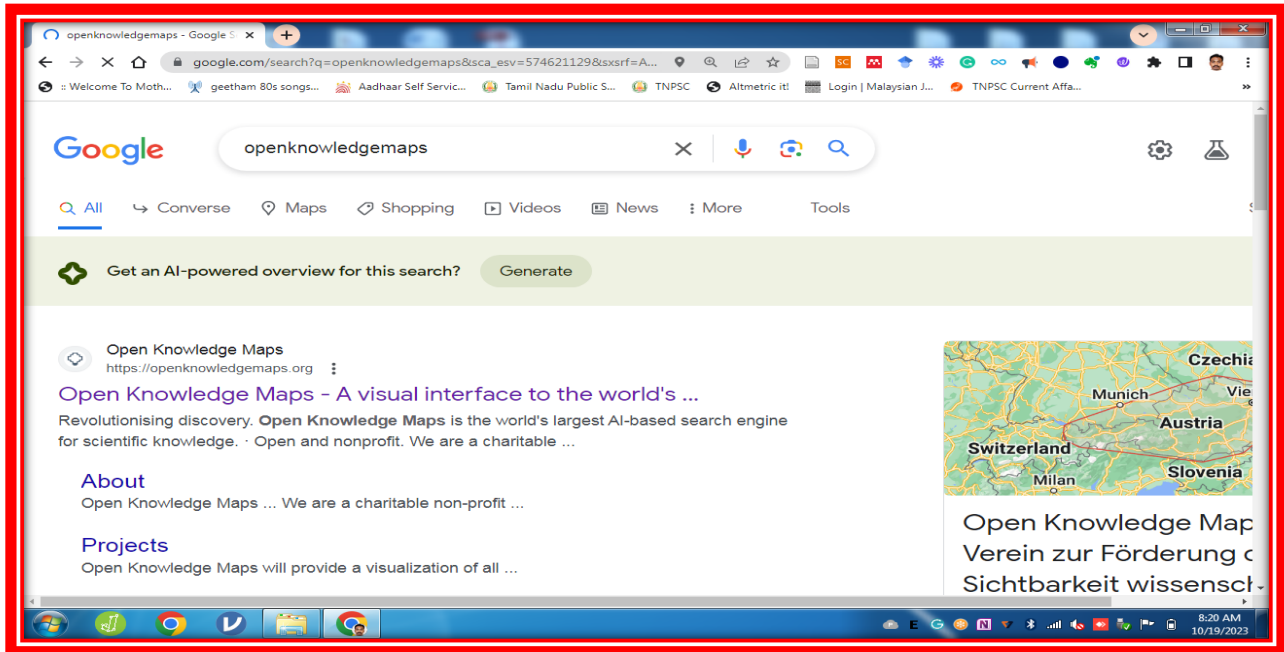


Head Start Architecture (Source: <https://elifesciences.org/labs/ef274c83/open-knowledge-maps-a-visual-interface-to-the-world-s-scientific-knowledge>)

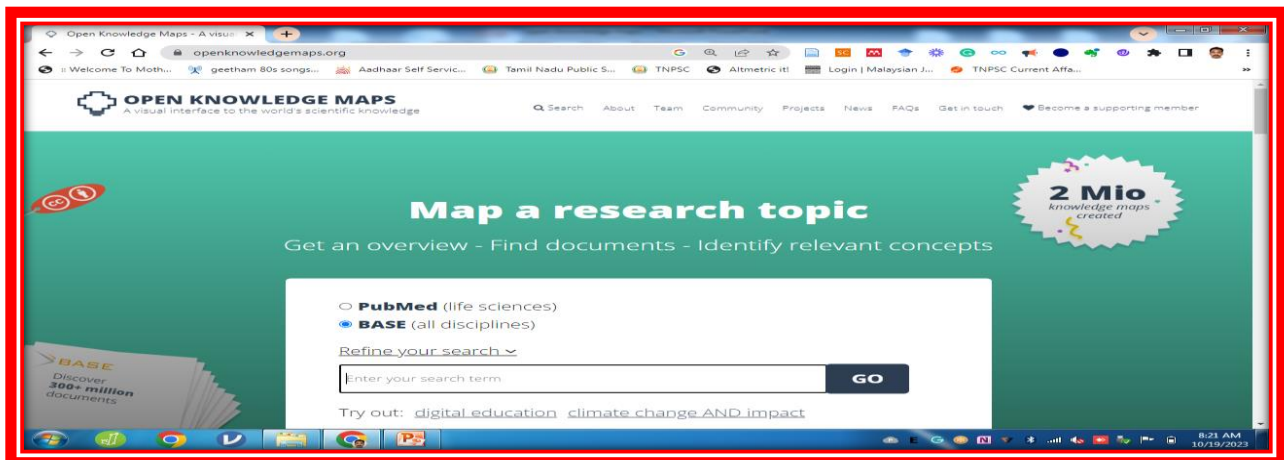
How does OKM work? The figure shows clearly how OKM works.



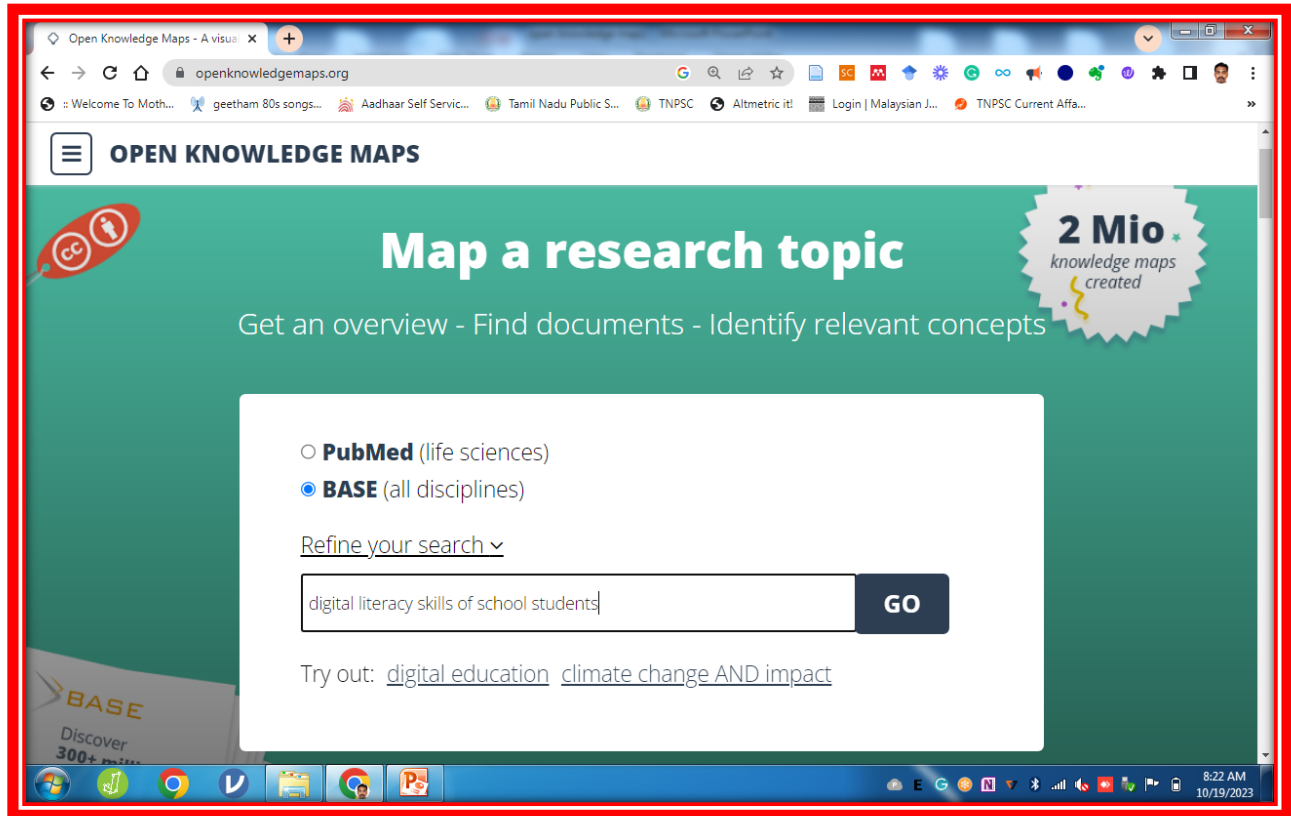
1: Go to Google and type Openknowledgemaps. Click the first result '<https://openknowledgemaps.org>' to reach the site.



2: Open Knowledge Maps provide us two possibilities. We can either search for the research papers from PubMed database or BASE. If you are interested to get papers about life sciences, medicine, health, biotechnology, diseases etc, then PubMed is the ideal choice. If you want to get research papers across all disciplines, then you may try BASE – Bielefeld Academic Search Engine – that is multidisciplinary in nature and searches for scholarly resources from the chosen content providers.

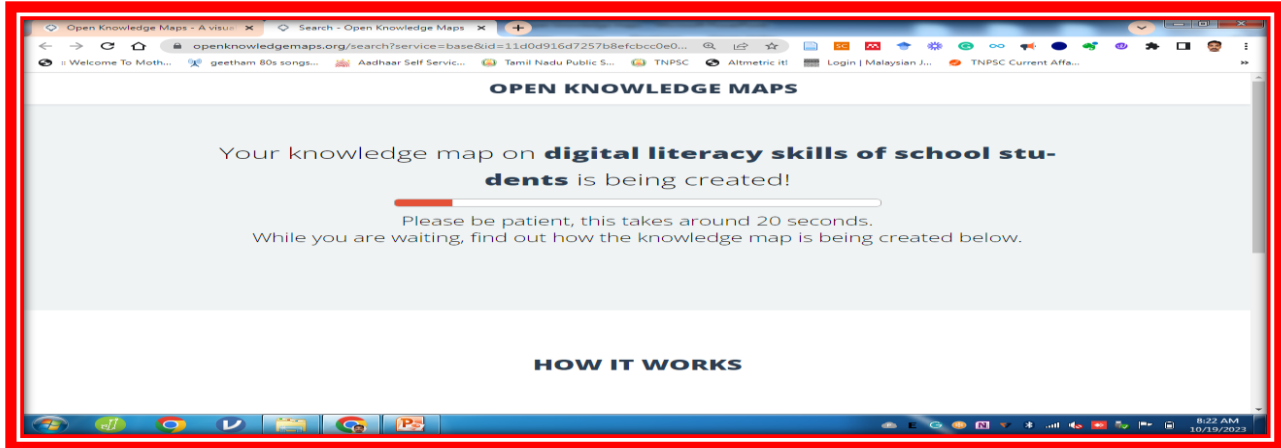


3: I have selected ‘BASE’ by clicking the relevant radio button. I have entered the following keywords: “Digital Literacy skills of school students”. Then, click ‘ Go ’.

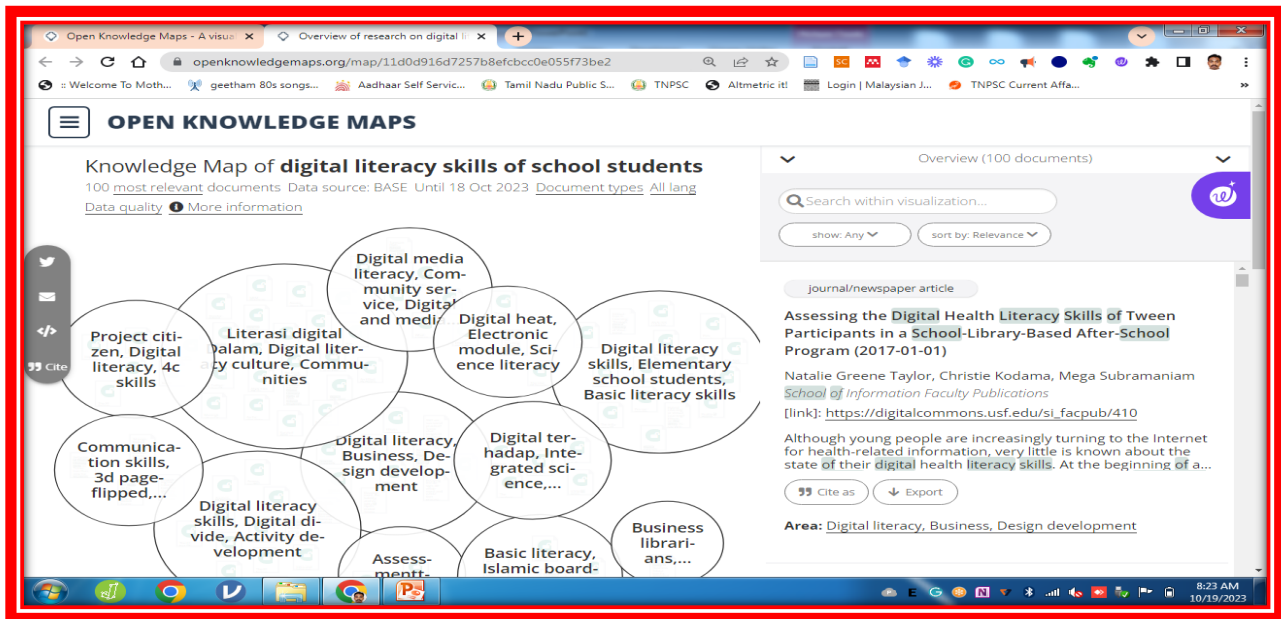


This will create a knowledge map to get a topical overview of research on the keywords entered based on 100 most relevant documents that best match your search query. They use the ‘Text Similarity’ algorithm to find out the 100 best documents based on the terms that frequently occurred in those research papers.

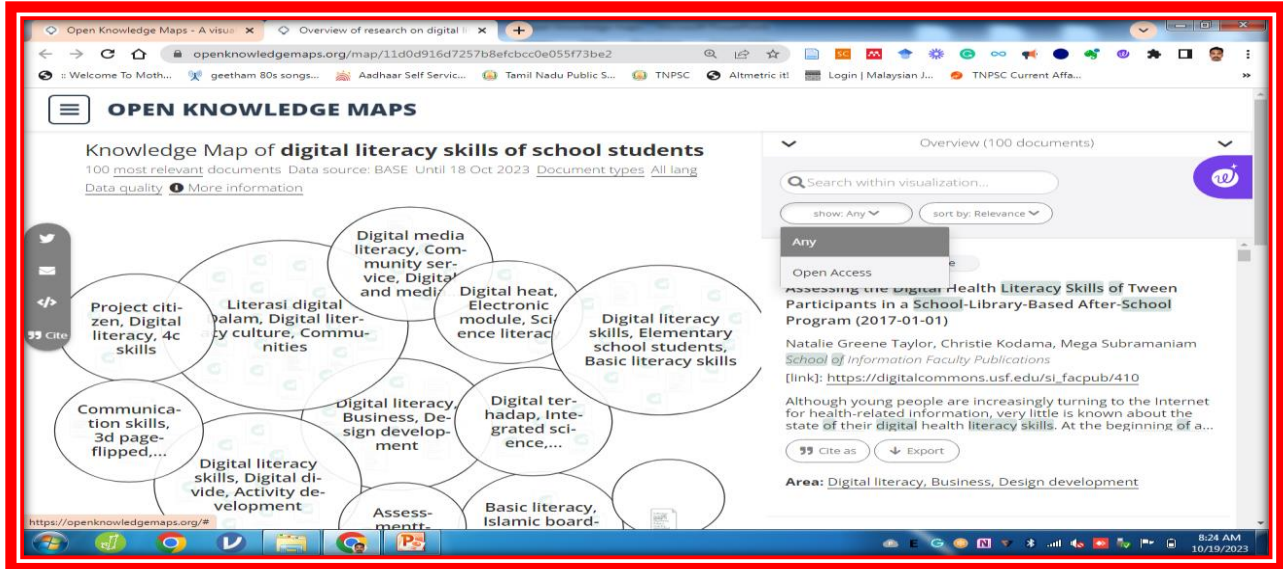
4: The screen shows that a knowledge map on ‘ digital literacy skills of school students ’ is getting ready.



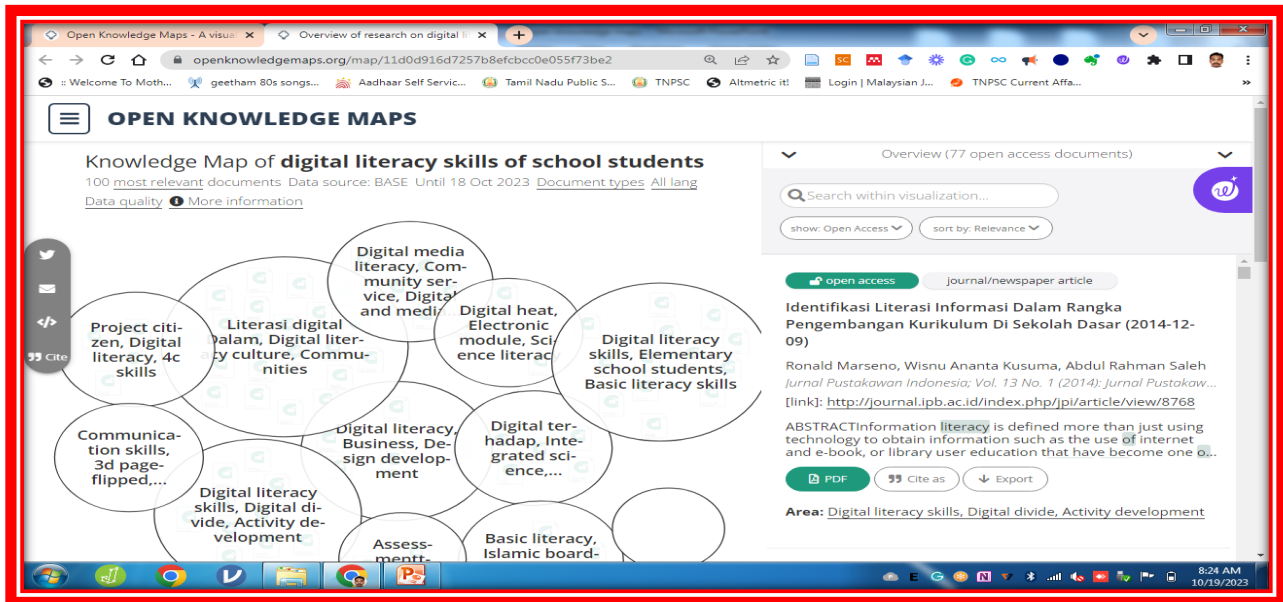
5: The knowledge map is thus created. You could see on the left side bubbles of different sizes and a good number of workable options on the right side. The size of the circles denotes the size of the category. Each circle is a categorized section of reviews. Each set of reviews represent certain common characteristics among them. The research papers bundled in each circle show an interlinked connection between the documents based on the text similarity concept.



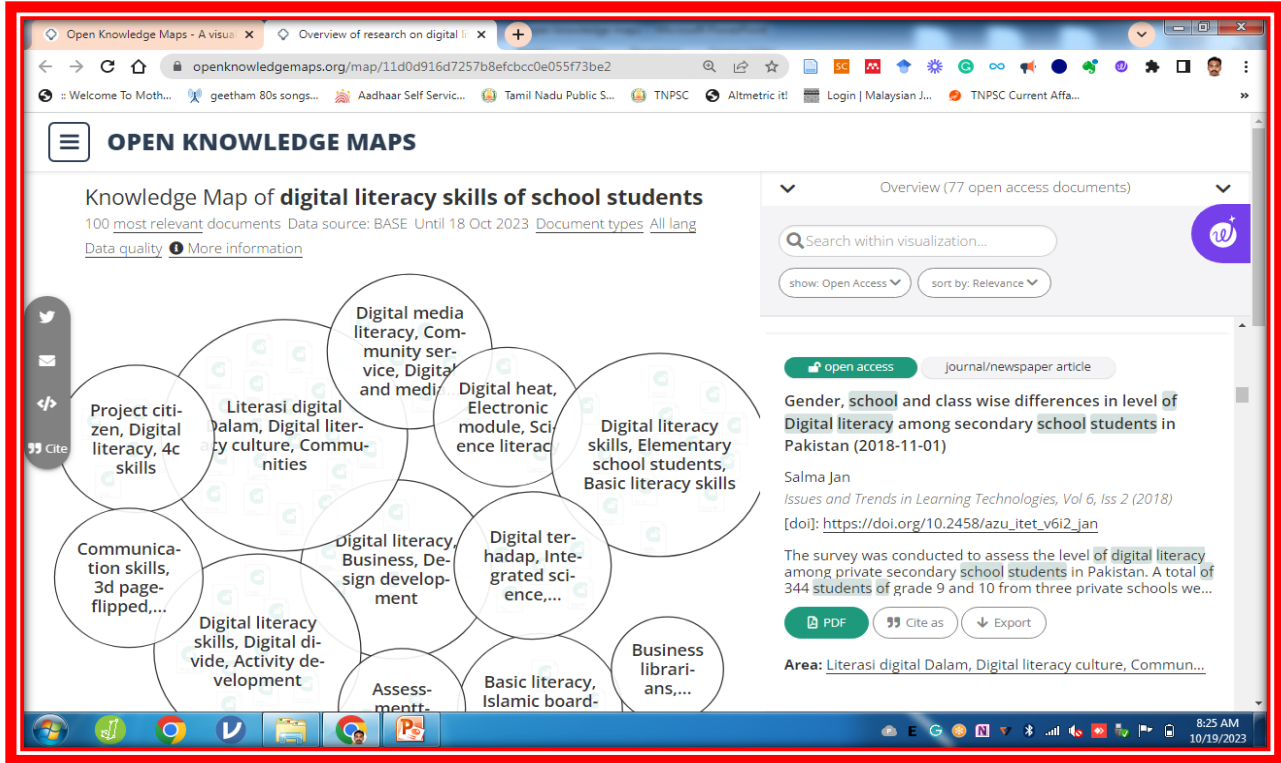
6: We could see on the right side many options. We can search for the papers using keywords. We can create knowledge map either based on all the 100 documents retrieved or based on only those open access research papers. I have chosen 'Open Access' from the dropdown menu.



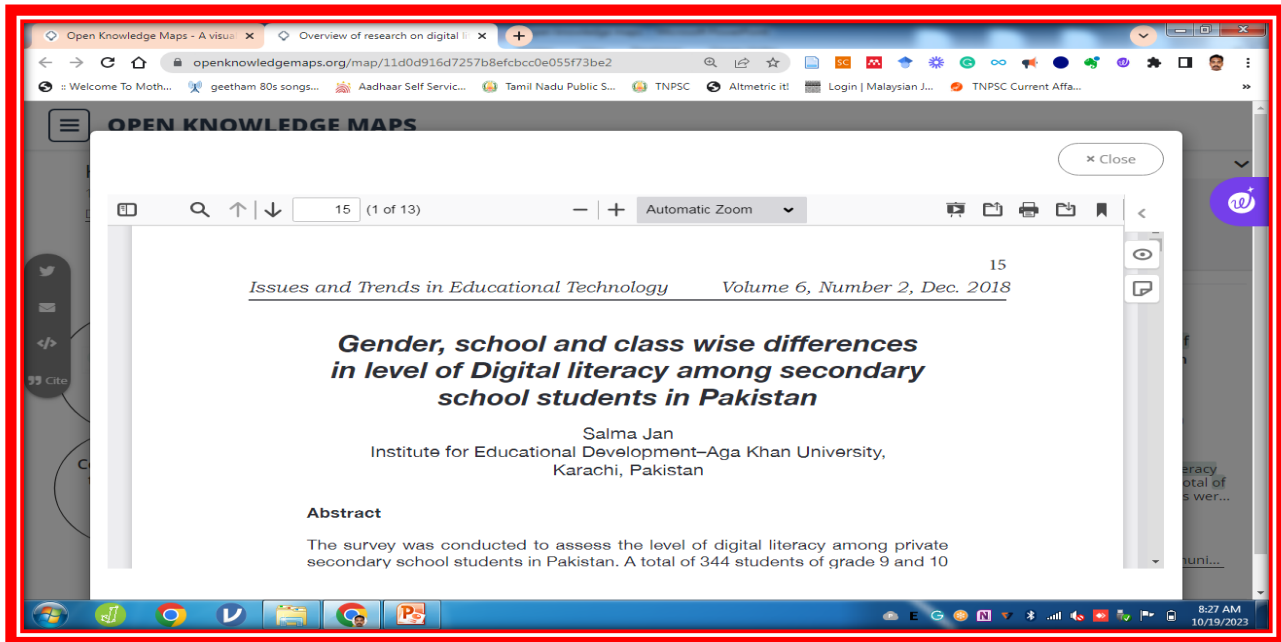
7: Now, you can see only 77 open access documents related to ‘digital literacy skills of school students’ out of 100 documents retrieved earlier. We have filtered the results.



8: Below every research paper on the right side, we have three options. They are : PDF, Cite as and Export. Click ‘PDF’ to get the full text of the paper. Since all the 77 papers being included in the knowledgemap are open access papers, we can easily get PDF version of the selected paper.

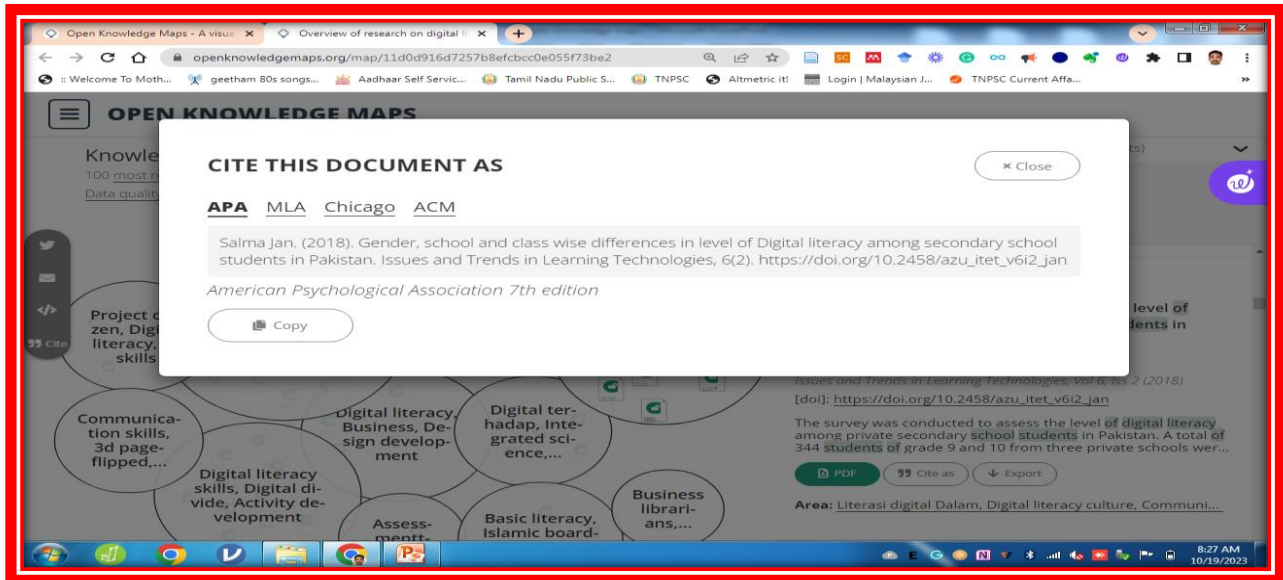


9: You can now see the full text of the research paper bring selected.

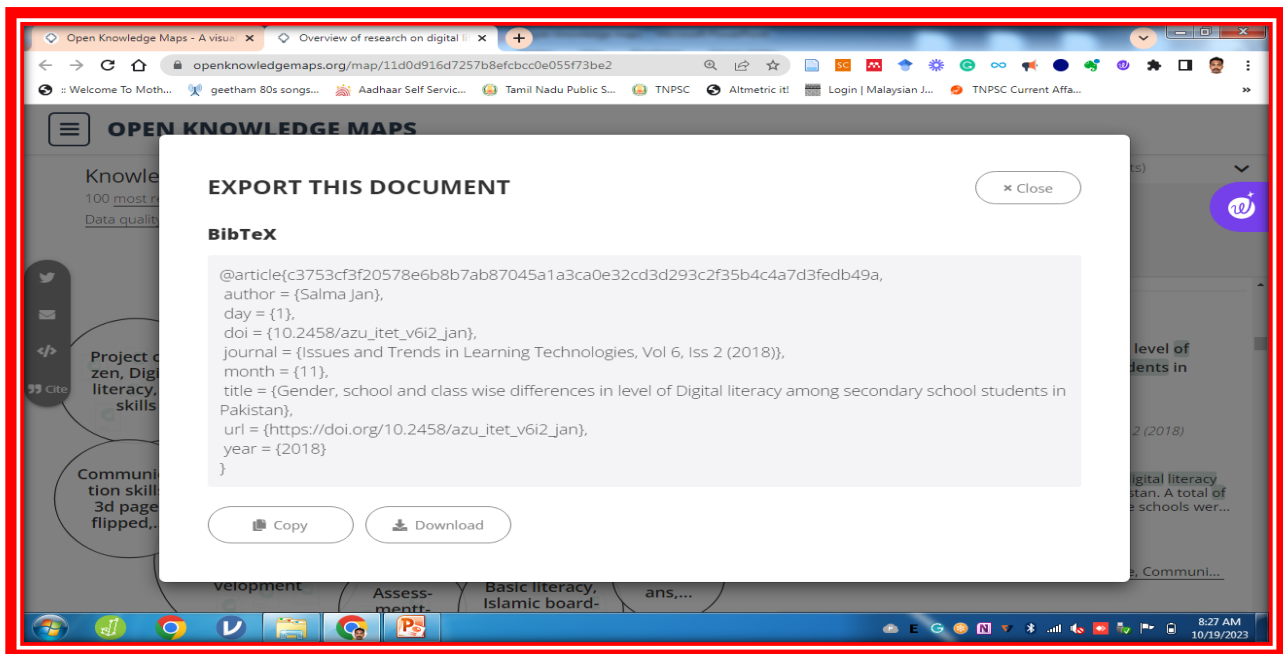


10: The second option is 'Cite as'. Click it. You will get the following screen. We can have the citation for the chosen PDF in four different styles namely APA, MLA, Chicago and ACM. By

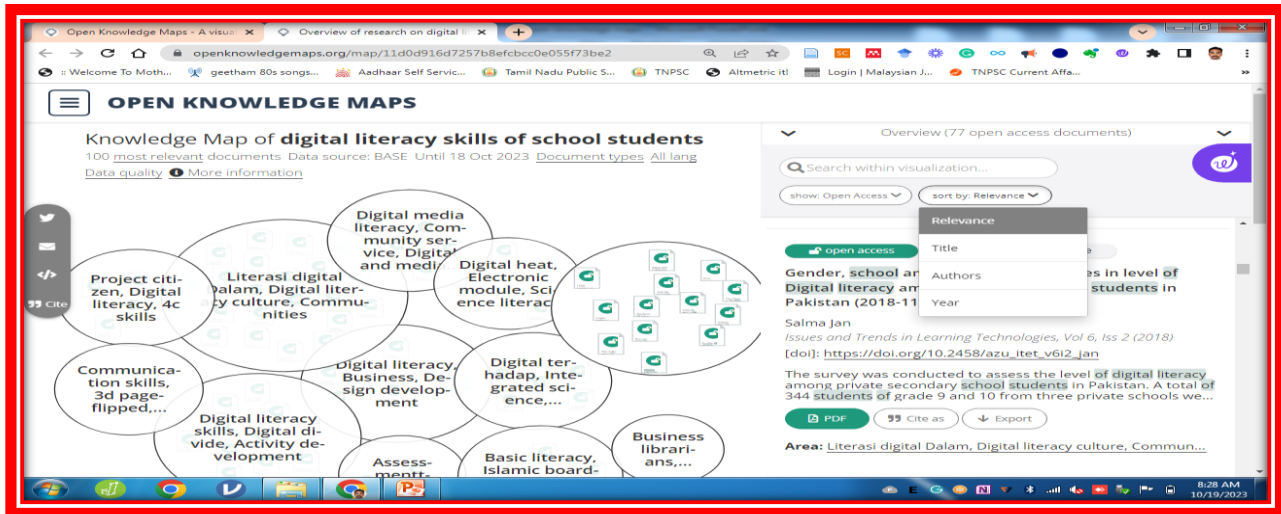
default, the reference entry for the PDF file in APA 7th Edition is given. We can change it just by clicking the required style manual. Click ‘Copy’ to copy the reference entry into computer cache memory. Then, you can paste the entry in any doc/docx file using paste command.



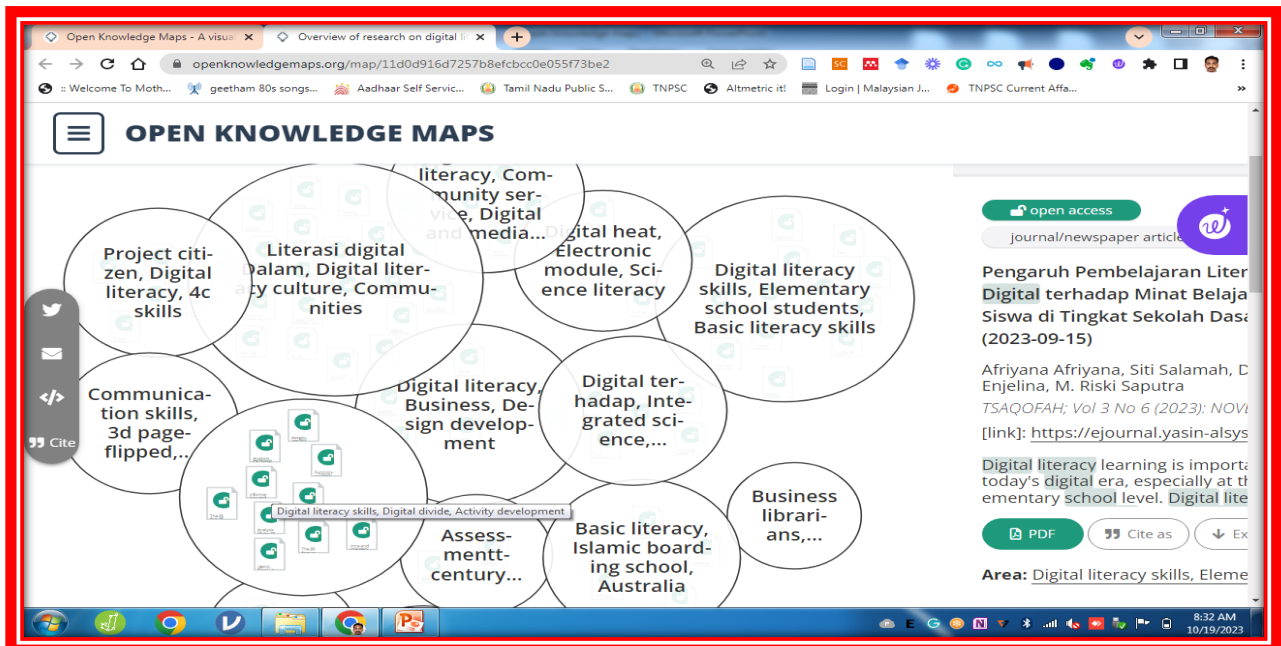
11. The third option available for the individual documents is ‘Export’. Click ‘Export’. The citation / bibliographical details of the chosen file can be saved or copied as BibTex File. Once it is downloaded as a BibTex file, then, you can use any reference management software to import the details.



12: The 77 research papers retrieved as the results can be sorted and arranged by title, authors or year. If you want to get the latest papers on the chosen area of research, then you can sort the 77 records by year of publication.

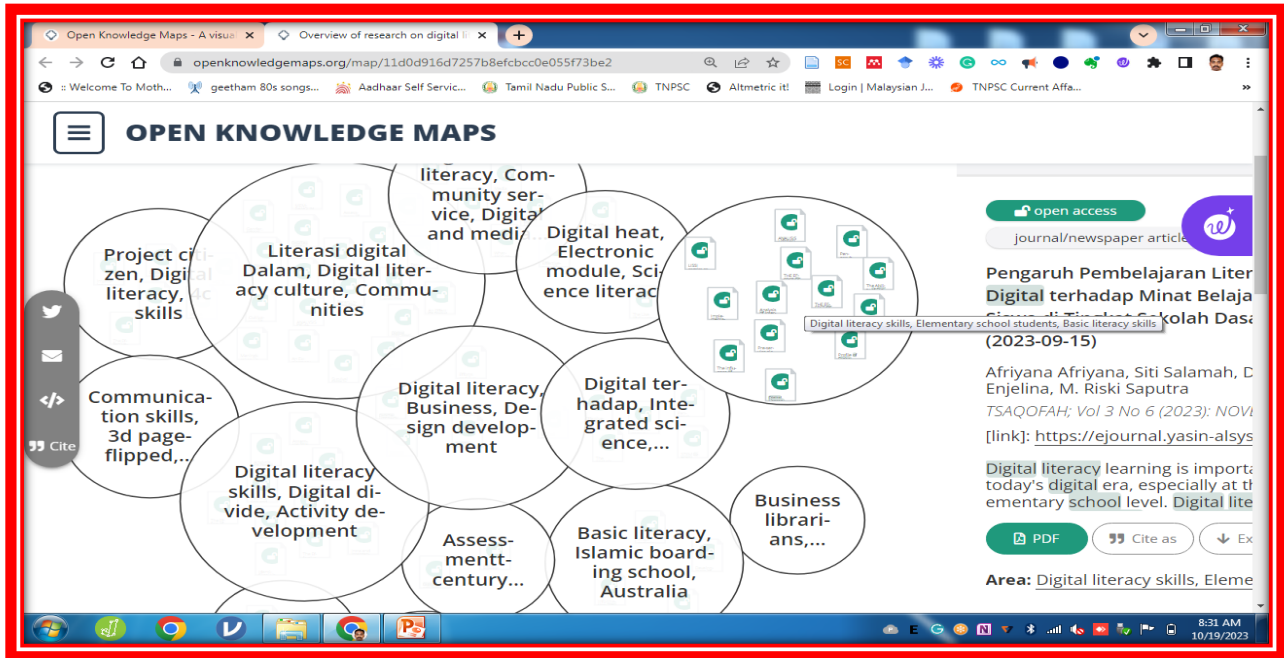


13: Now, click any circle of your choice. I have clicked the circle named as ' Digital literacy, Digital Divide, Activity development. Now the individual papers in the group become visible as green colour icons. The research papers included in the chosen circle are listed on the right side panel.

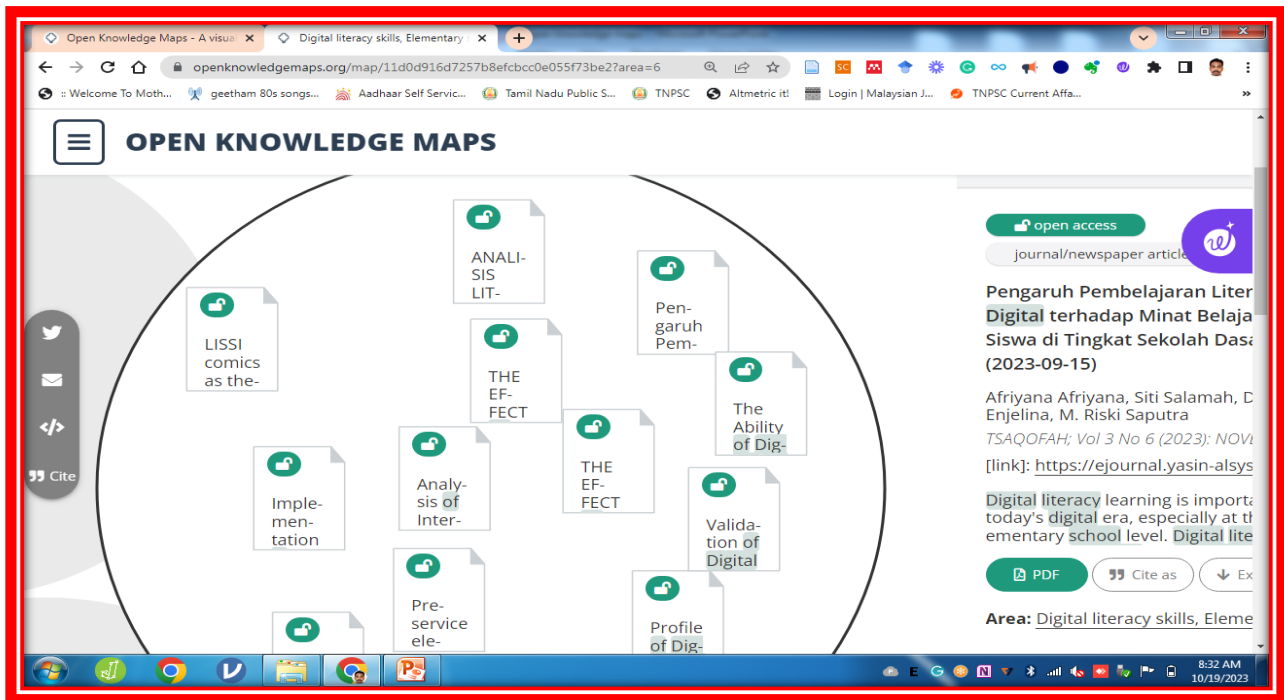


14: The next circle chosen by me, as indicated in the following figure, shows that this

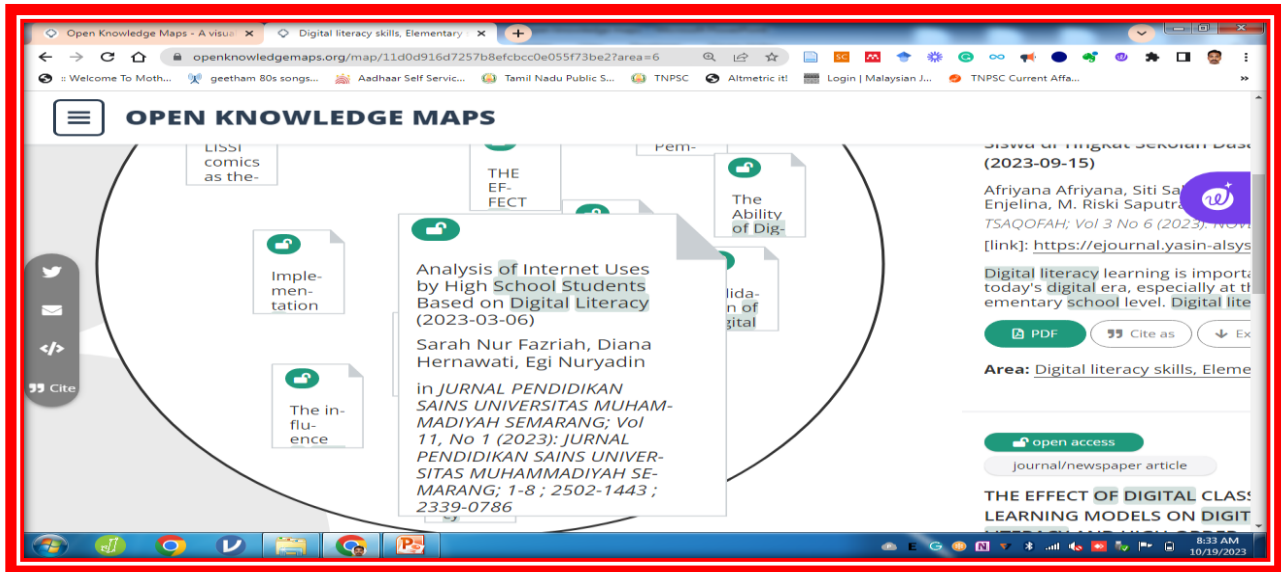
categorically arranged research papers circle is about ‘ Digital literacy skills, Elementary school Students, basic literacy skills’.



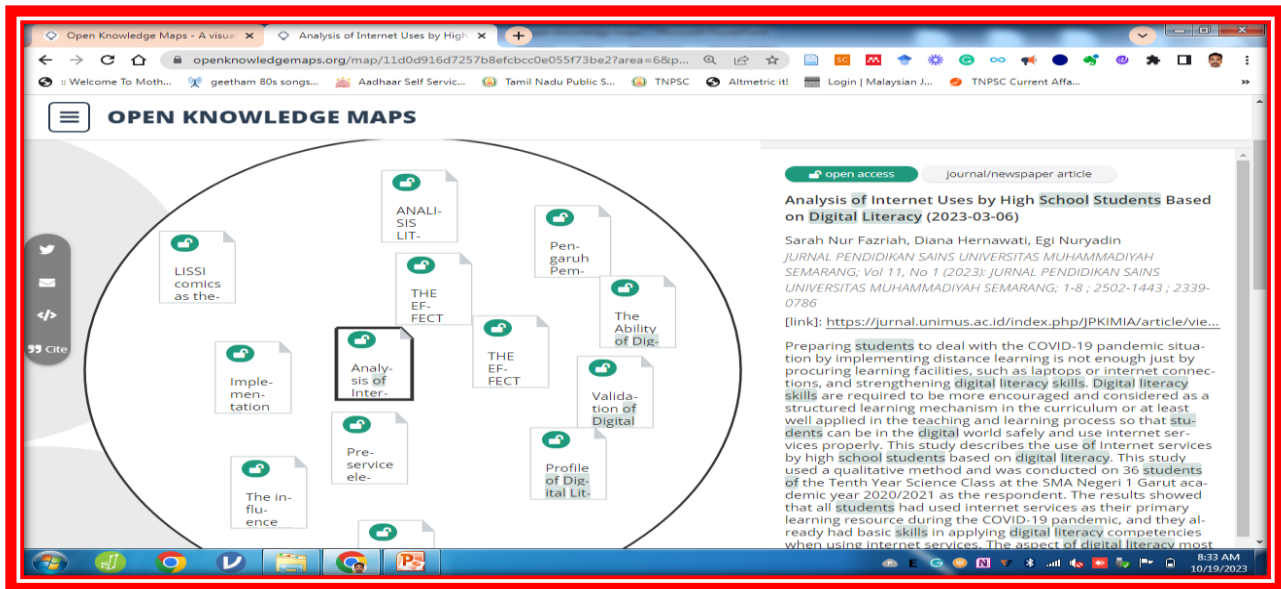
15: Click the circle once again to get a separate screen showing only those research papers which included in the chosen circle.



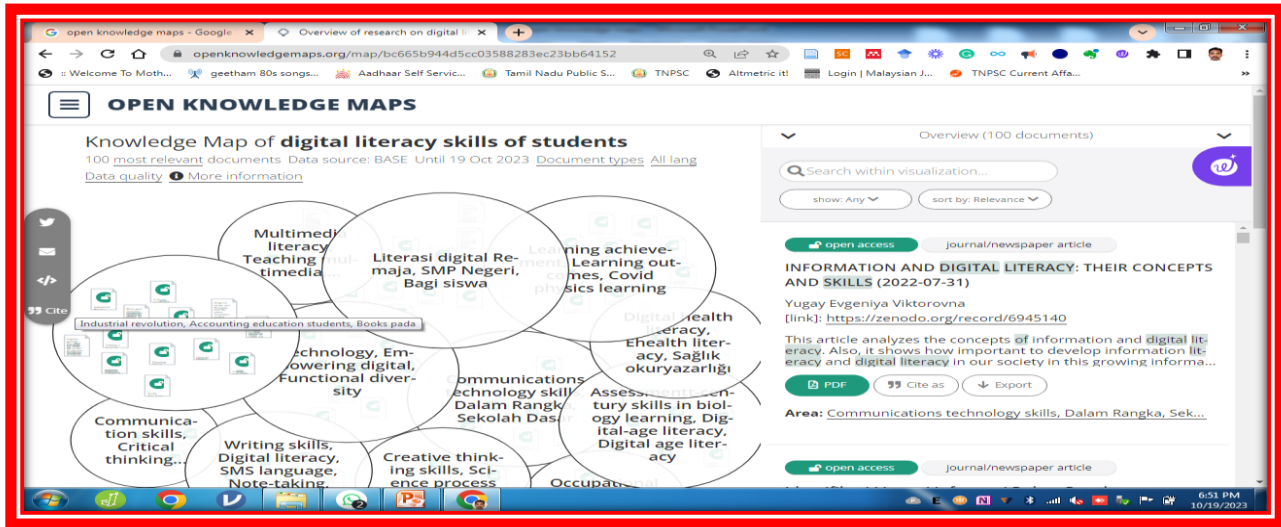
16: Hover the mouse over any of the individual file included in the chosen circle, will give you're the basic details about the research paper such as title of the paper, name of the author(s), name of the journal, volume number, issue number, page numbers and ISSN number.



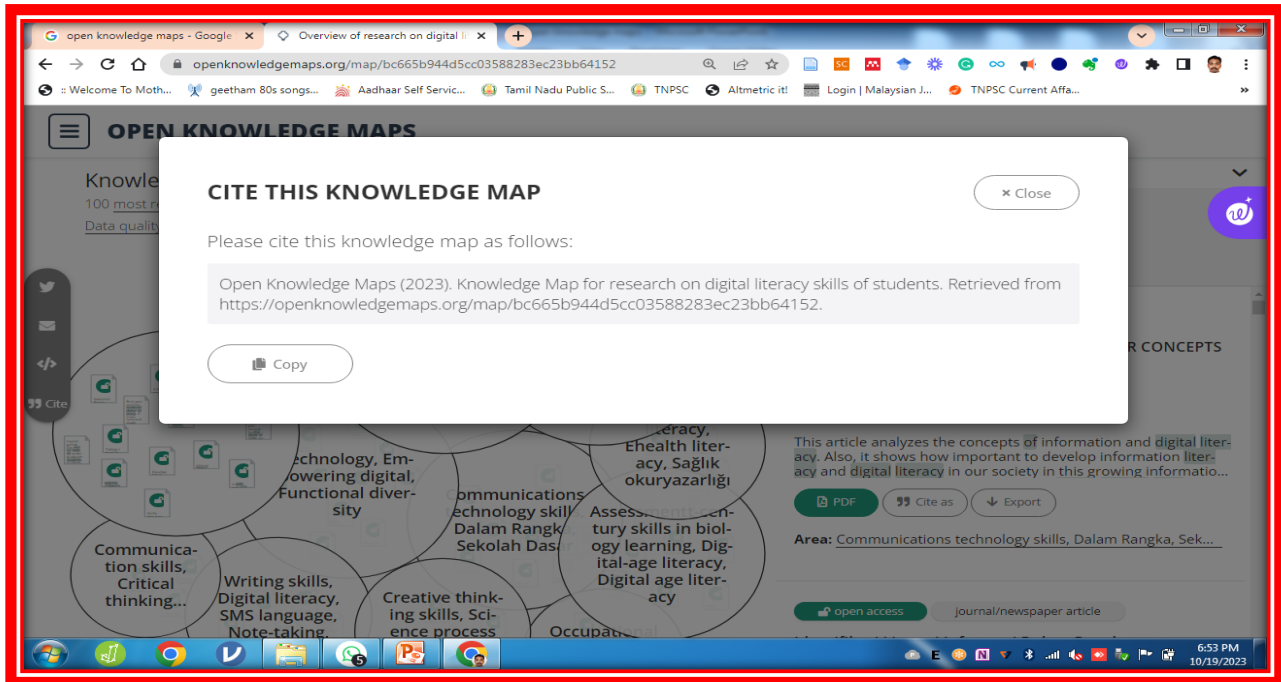
17: Now, click any one individual document. The details of the paper appear on the right side pane. The title of the research paper, name of the authors, source, volume and issue number, year of publication, page numbers, ISSN number, link to access the full text and abstract of the paper are available on the right pane. This helps you to decide whether the paper is relevant and needs any further exploration. If relevant, click the link to get the full text of the research paper.



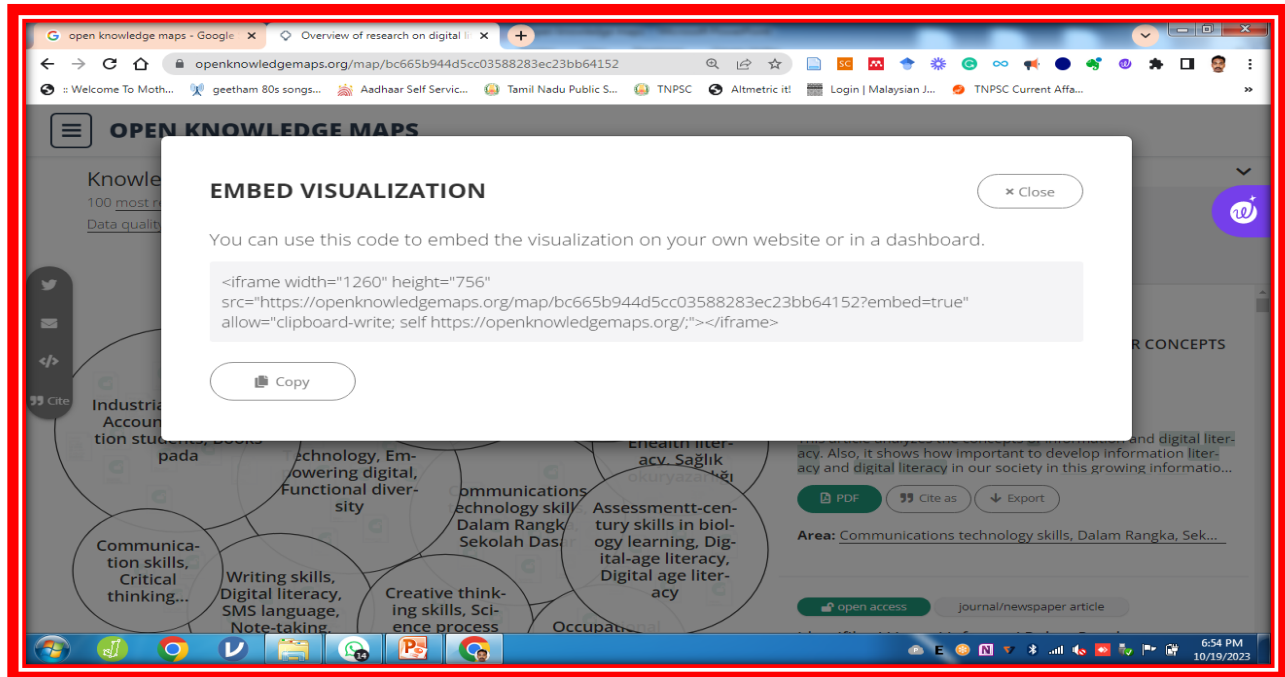
18: The top paragraph informs us that the knowledge map is created with 100 most relevant documents and the data source is BASE. The OKM was created on 19/10/2023. The map includes all kinds of documents and all languages. If you click the button, a small pop up appears. There are options to share the OKM either via Twitter or Mail. There is another option to cite. I have clicked 'Cite'.



19: The following screen shows how to cite this particular OKM. Click Copy to copy the reference and you may paste it in the desired bibliography of your research paper.



20: If you are interested to get the code to embed this particular OKM in your own website or in a dashboard, then click the symbol '</>'. You can see the code in the next screen that can be pasted in your blog or website widgets or templates for a display.



Concluding Remarks

The substantial potential of AI in scientific writing is still not fully realized, urging scholars to give immediate attention to exploring its untapped avenues for research and discovery. However, to utilize its benefits responsibly, we must probe deeper into understanding the various utilities of AI applications while maintaining a delicate balance between ethical use, research excellence, and integrity, and avoiding misconduct (BaHammam et al., 2023). Used responsibly, AI can benefit people and society as a whole by unlocking the full potential of education and research. However, it is important to integrate AI with ethical decision-making to ensure that humane care is maintained and all issues related to personal data and injustice are resolved. Used responsibly, AI can unlock the full potential of education and research by providing students with valuable and personalized learning experiences and researchers with the quality of tools and consensus to foster knowledge and innovation (Kenchakkanavar, 2023). Despite the potential drawbacks associated with AI-based research utility platforms, it is important to acknowledge the numerous positive impacts that AI can bring to research and

technical writing. The utilization of AI holds great promise in terms of increased efficiency, improved accuracy, enhanced objectivity, updated context, and time-saving capabilities. As we navigate the information age, AI has become an indispensable tool in academia. However, it is crucial to ensure that the technology is utilized ethically, as any misuse or unethical practices can undermine the integrity of scientific research and communication. By leveraging AI responsibly and with a strong ethical framework, we can harness its immense potential and pave the way for a brighter future in research and knowledge dissemination (Bankar & Lihitkar, 2023).

The purpose of this paper is to demonstrate how to make use of a freely available AI tool called ‘ Open Knowledge Map’ to create clusters of research papers pooled together based on text similarity algorithm with the opens source software’ Head Start’. The process is simple and the result is quite impressive. The OKM categorizes the research papers (100 most relevant papers) into meaningful groups. It saves the time of the researchers. If we search for only open access papers, then full texts can be accessed. I feel that the coverage of the OKM can be extended to other databases too. It is limited to PubMed and BASE now. Other open access aggregators, online resource vendors and search engines may also be added. Some sort of freedom may be given to the OKM users to choose number of research papers that need to be considered for forming categorized cluster of reviews. The use of OKM is to go alongside the critical thinking of the researchers. Such AI tools need to be used with due ethical considerations and copyright implications.

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