Effects of AI-Based ChatGPT on Higher Education Libraries

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Effects of AI-Based ChatGPT on Higher Education Libraries

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ABSTRACT

Purpose: *Artificial Intelligent (AI) Technology-based systems are expected to replace or complement many services in various industries. AI-based GPTs are able to provide expert information in all industry sectors. Hence it is decided to examine the possibility of using ChatGPT to replace the conventional Library in higher education.*

Methodology: *We made an exploratory study on the effects of AI-Based ChatGPT on Higher Education Libraries. This includes a description of the effect of technology on information collection and an analysis of the AI-based GPTs in terms of their capability to provide the right information at any time by evaluating the model of AI-based GPTs in terms of information generation and dissemination. This also includes a systematic comparison of the services provided by traditional libraries and digital libraries with AI-based GPT for students/readers, a study of the advantages, benefits, constraints, and disadvantages of ChatGPT in terms of providing Library services to readers by ABCD analysis framework and interpretation of the impact of AI-based GPTs on the information collection process of the Higher Education System.*

Findings: *Based on analysis, comparison, and evaluation of ChatGPT with traditional and digital library systems, some suggestions are given on the use of AI-GTPs in Higher Education based on its advantages and benefits to the readers of tangible or intangible resources provided in libraries. It is found that AI-based GPTs are expected to be complementary to traditional libraries in terms of providing customized information support.*

Originality/Value: *An exploratory study is carried out based on collecting information from various authentic sources to analyse, compare, evaluate, and interpret the topic under consideration on the effect of AI-based ChatGPT on higher education libraries.*

Type of Paper: *Explorative Study.*

Keywords: ChatGPT, Artificial Intelligence base GPTs, AI-based GPTs in Higher Education, SWOC analysis, ChatGPT for Library Services, ChatGPT for Information, Exploratory study

1. INTRODUCTION :

Technology refers to the application of scientific knowledge for practical purposes. It includes a wide range of tools, techniques, and systems that are designed to solve problems, improve efficiency, and enhance human capabilities. Technology has been instrumental in transforming and improving various aspects of society. In the education industry, technology is used for making innovations in the way we learn & teach and made education more accessible to people of all ages and backgrounds. Online courses, virtual classrooms, and educational apps have made it easier for people to learn at their own pace, on their own time. It also improves the quality of service offered, making tasks easier, and expanding our capabilities. Technology has had a major impact on education, making learning more accessible and engaging [1-2]. Online courses, educational software, and digital textbooks have made it possible for people to learn from anywhere at any time. Some of the examples of how technology is being used in education include: (1) Online learning platforms like Coursera, Udemy, and Khan Academy provide access to high-quality educational materials and courses to anyone with an internet connection. Students can learn at their own pace, from anywhere in the world, (2) With virtual classrooms, students and teachers can connect in real-time from different locations. This technology

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makes it possible for students to attend classes from remote areas and also provides access to specialized courses that may not be available in their local schools, (3) Educational apps like Duolingo, Quizlet, and Edmodo are designed to help students learn, and practice new concepts. These apps provide a fun and interactive way to learn, making education more engaging and effective, (4) The use of game-like elements in education, known as gamification, has been shown to increase student engagement and motivation. Gamification can be used in a variety of educational contexts, from language learning to science experiments, (5) Artificial Intelligence is increasingly being used in education to personalize learning, provide feedback, and assess student performance. AI-powered tools can help teachers identify areas where students may be struggling and provide targeted support.

Ubiquitous education technology, also known as ubiquitous learning (u-learning), supports the integration of technology into learning environments in a way that makes education available anytime and anywhere [3-5]. Some of the ubiquitous education technology features can improve information-based learning include:

(1) Personalized learning: Ubiquitous education technology can be used to personalize the learning experience, tailoring the content and pace of instruction to the needs of individual learners. This can help to improve the effectiveness of the learning process, as learners are more likely to engage with material that is relevant and interesting to them.

(2) Collaborative learning: Ubiquitous education technology can also facilitate collaborative learning, allowing learners to work together in real-time, regardless of their location. This can help to improve social interaction and communication skills, while also fostering a sense of community and shared learning.

(3) Mobile learning: Ubiquitous education technology makes it possible for learners to access educational materials on-the-go, using mobile devices like smartphones and tablets. This can help to improve accessibility and convenience, allowing learners to study and learn at their own pace, wherever and whenever it is most convenient for them.

(4) Interactive learning: Ubiquitous education technology can also facilitate interactive learning experiences, using tools like virtual reality and augmented reality to create immersive educational environments that engage learners and promote deeper learning.

(4) Access to a wide range of resources: Ubiquitous education technology makes it possible for users to access a wide range of resources, including multimedia content, online databases, and collaborative learning tools. This makes it easier for users to find the information they need and to collaborate with others to enhance their learning experience.

(5) Real-time feedback: Ubiquitous education technology can provide real-time feedback to users, allowing them to monitor their progress and identify areas where they need to focus their attention. This feedback can help users stay motivated and engaged in the learning process.

(6) Blended learning: Ubiquitous education technology can also enable blended learning, where users can learn through a combination of online and in-person instruction. This can provide a more flexible and personalized learning experience, allowing users to get the best of both worlds.

Apart from the above, advents in technology support the development of Universal Digital Libraries (UDL) which have the capabilities to provide learning resources in the form of ubiquitous information [6-7]. Further, the importance of such UDL is getting diluted due to the development of Artificial Intelligence and other technology-supported GPTs. This is due to the fact that AI-based GPTs have abilities to provide global information in any language as expert advice. In this paper, we made an exploratory study on the Effects of AI-Based ChatGPT on Higher Education Libraries by comparing the capabilities of ChatGPT with that of conventional physical and digital libraries.

2. OBJECTIVES OF THE CHAPTER :

In this paper, we made an exploratory study on the effects of AI-Based ChatGPT on Higher Education Libraries. The objectives of the study include:

(1) To discuss the effect of technology on information collection.

(2) To analyze the AI-based GPTs in terms of their capability to provide the right information at any time

(3) To evaluate the model of AI-based GPTs in terms of information generation and dissemination

(4) To compare the services provided by traditional libraries and digital libraries with AI-based GPT for students/readers.

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(5) To study the advantages, benefits, constraints, and disadvantages of ChatGPT in terms of providing Library services to readers.

(6) To interpret the impact of AI-based GPTs on the information collection process of the Higher Education System.

(7) To suggest the use of AI-GTPs in Higher Education based on its advantages and benefits to the readers.

3. VARIOUS GPTS AND THEIR CAPABILITIES :

There are several GPTs (Generative Pre-trained Transformer models) currently available with varying capabilities in terms of providing the right information at the right time [8]. Few examples include:

(1) GPT-3: Developed by OpenAI, GPT-3 is currently one of the most advanced GPT models available. It can generate human-like responses to a wide range of prompts, including text completion, translation, and summarization.

(2) GPT-2: Also developed by OpenAI, GPT-2 is capable of generating coherent and grammatically correct responses to a wide range of prompts, including text completion, translation, and summarization.

(3) GPT-1: This was the first GPT released by OpenAI and has 117 million parameters. It is less powerful than GPT-2 and GPT-3, but still has the capability to generate coherent text and answer questions.

(4) T5: Developed by Google, T5 is a GPT model that is capable of performing a wide range of natural language processing tasks, including translation, text summarization, and question answering.

(5) BERT: Developed by Google, BERT (Bidirectional Encoder Representations from Transformers) is a GPT model that is particularly adept at understanding the context of words in a sentence, making it well-suited for tasks like sentiment analysis and natural language understanding.

(6) XLNet: Developed by Carnegie Mellon University and Google, XLNet is a GPT model that is particularly adept at dealing with long sequences of text, making it well-suited for tasks like document classification and text summarization.

(7) CTRL: This GPT was developed by Salesforce and has been used for tasks such as text completion and generation.

(8) RoBERTa: This GPT was developed by Facebook AI Research and has been used for tasks such as language modeling and text classification.

Each of these GPT models has its own strengths and limitations, and the suitability of a particular model will depend on the specific task or application. It's important to carefully consider the capabilities of each model when selecting the appropriate GPT for a particular task. In terms of providing the right information at the right time, the effectiveness of each GPT will depend on several factors, including the quality of the training data, the specificity of the query, and the context in which the information is being sought. GPT-3 is currently one of the most powerful GPTs available, with the ability to generate high-quality text on a wide range of topics. However, the most suitable GPT for a specific task will depend on the specific requirements and context of the task.

3.1 How AI-Based GPT collects information?

AI-based GPT (Generative Pre-trained Transformer) is a language model that uses a combination of machine learning and natural language processing (NLP) techniques to collect and analyze information [9]. AI-based GPTs collect information by using a large corpus of text data as input during their pre-training phase. This corpus of data can come from a variety of sources, such as books, articles, websites, and other text-based sources.

Here's how it works:

(1) Pre-training: GPT is pre-trained on a large corpus of text data, such as books, articles, and web pages. During pre-training, the model uses unsupervised learning techniques to identify patterns and relationships in the data.

(2) Fine-tuning: After pre-training, GPT can be fine-tuned on specific tasks or domains, such as text classification or language translation. Fine-tuning involves training the model on a smaller dataset of labeled examples that are specific to the task at hand.

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(3) Input processing: When given a new input, such as a sentence or paragraph of text, GPT uses its pre-trained and fine-tuned models to analyze and interpret the input. This involves breaking the input down into smaller units, such as words or phrases, and analyzing the relationships between them.

(4) Contextual analysis: GPT uses a technique called "contextual analysis" to understand the meaning of the input in context. This involves considering not only the individual words in the input, but also the relationships between them and the broader context in which they appear.

(5) Output generation: Based on its analysis of the input, GPT can generate a variety of outputs, such as text responses, summaries, or translations. The outputs are generated based on the model's understanding of the input and the patterns it has learned from the pre-training and fine-tuning steps.

Hence, GPT is a powerful tool for collecting and analyzing information in natural language. By leveraging the latest advances in AI and NLP, GPT can process and analyze large volumes of text data quickly and accurately, making it a valuable tool for a wide range of applications.

3.2 How AI-Based GPT make decisions?

AI-based GPT (Generative Pre-trained Transformer) models, such as GPT-3, do not make decisions in the traditional sense. Instead, they generate responses based on the patterns and relationships they have learned from large datasets of text data during pre-training and fine-tuning [10].

When GPT models are used to generate text, they use a technique called "autoregression" to generate a sequence of words that are most likely to follow the input prompt or context. The model generates each word one at a time, based on the probability of each possible word given the words that have already been generated. When given a prompt or a question, the GPT model uses its understanding of language and context to generate a response that is relevant and coherent. The model generates this response based on the patterns and relationships it has learned during pre-training and fine-tuning for specific tasks.

While GPT models do not make decisions in the same way that humans do, they can be used to support decision-making by generating responses or predictions that are based on their understanding of language and context [11]. However, GPT models do not have the ability to make decisions or judgments on their own. They are limited to generating responses based on the input they receive, and they do not have the ability to take action or make decisions based on their responses. For example, a GPT model could be used to generate a summary of a lengthy document or to provide insights based on a dataset of customer feedback.

It's important to note that while GPT models can generate responses that are relevant and coherent, they are not always accurate or unbiased. As with any machine learning model, it's important to carefully evaluate the outputs and consider the limitations of the model when using it to support decision-making. Therefore, while AI-based GPT models can be very useful for generating insights and information, they are not a replacement for human decision-making. Instead, they can be used to augment human decision-making by providing additional information and insights that can help inform decisions.

4. TRADITIONAL LIBRARY SYSTEMS IN HIGHER EDUCATION :

Traditional libraries play an essential role in higher education by providing students, faculty, and researchers with access to a vast collection of scholarly resources. These libraries are typically housed within academic institutions and are staffed by trained professionals who help users navigate the library's resources. In addition to physical books and journals, traditional libraries offer access to electronic resources such as online databases, e-books, and e-journals. These resources are often essential for research in various fields of study and are frequently updated to ensure the most current information is available.

Traditional libraries also offer a variety of services to support students and faculty in their academic pursuits, such as reference services, interlibrary loan, and instruction in information literacy skills. These services are particularly valuable for students who are just beginning their academic journey and need assistance navigating the vast array of resources available to them. Hence, traditional libraries remain an essential component of higher education, providing students, faculty, and researchers with access to a wealth of resources and support services that are vital for academic success.

4.1 Importance of Library in Higher Education:
Library play a crucial role in higher education [13-14]. This is due to following reasons:

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(1) Access to resources: Library systems provide students, faculty, and staff with access to a wide range of resources, including books, journals, magazines, and online databases. These resources are essential for conducting research and completing coursework.

(2) Support for learning and research: Library systems provide support for learning and research through a variety of services, including reference and research assistance, interlibrary loan, and document delivery.

(3) Collaboration and community: Library systems provide a space for collaboration and community building. Many libraries offer study spaces, group meeting rooms, and other resources that encourage collaboration and social interaction among students, faculty, and staff.

(4) Preservation of knowledge: Library systems are responsible for preserving and maintaining knowledge for future generations. They collect, organize, and store information in a variety of formats, ensuring that it is accessible to future scholars and researchers.

(5) Information literacy: Library systems promote information literacy, teaching students how to locate, evaluate, and use information effectively. These skills are essential for success in higher education and in the workforce.

(6) Integration with technology: Library systems are increasingly integrating technology into their services and resources, such as providing access to online databases and e-books. This enables students and faculty to access information from anywhere and at any time.

Thus, library systems are an essential component of higher education. They provide access to resources, support for learning and research, a space for collaboration and community, preservation of knowledge, and promote information literacy.

4.2 Importance of Library in Research:

Library systems play a critical role in research by providing access to a vast array of resources, support, and services that are essential for conducting research effectively [15]. Here are some of the ways in which library systems are important for research:

(1) Access to information: Library systems provide access to a broad range of resources, including books, journals, online databases, and other specialized collections. These resources provide researchers with the knowledge and information they need to conduct their research.

(2) Research assistance: Library systems offer research assistance services to help researchers identify relevant resources and access them effectively. This may include help with literature searches, citation management, and database searching.

(3) Preservation of knowledge: Library systems are responsible for preserving and maintaining the scholarly record, including books, journals, and other materials. They ensure that this knowledge is available to researchers now and in the future.

(4) Interlibrary loan: Library systems can facilitate interlibrary loan services, allowing researchers to borrow materials from other institutions if they are not available locally. This can be essential for accessing hard-to-find or specialized resources.

(5) Open access: Library systems may also support open access initiatives, which make scholarly articles, data, and other materials freely available online. This increases the visibility and impact of research and promotes knowledge sharing.

Thus, library systems are critical for research as they provide access to resources, research assistance, preservation of knowledge, interlibrary loan services, and support for open access initiatives. They play a crucial role in enabling researchers to access the information they need, collaborate effectively, and produce high-quality research.

5. CHATGPT FOR INFORMATION COLLECTION :

ChatGPT can be a powerful tool for information collection, as it has the ability to gather and process vast amounts of data from a wide range of sources [16-25]. Here are some ways that ChatGPT can be used for information collection:

(1) Web Scraping: ChatGPT can be used to collect information from websites and other online sources, such as social media platforms and news sites. This information can be used to gain insights into user behavior, sentiment analysis, and market trends.

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(2) Natural Language Processing: ChatGPT's natural language processing capabilities allow it to analyze and interpret unstructured data, such as text documents and audio recordings. This can be useful for gathering information from customer feedback, surveys, and other sources of qualitative data.

(3) Data Integration: ChatGPT can integrate data from multiple sources, such as databases, APIs, and external systems. This can help to create a more complete picture of the data and provide deeper insights into trends and patterns.

(4) Chatbot Surveys: ChatGPT can be used to create chatbot surveys, which can be deployed to collect information from users in a more interactive and engaging way. This can be particularly useful for gathering feedback on products, services, and customer experiences.

Hence, ChatGPT can be a powerful tool for information collection, providing businesses and organizations with valuable insights into their customers, products, and markets. However, it is important to ensure that data collection is done ethically and with user privacy in mind.

ChatGPT can be a useful tool for information collection, especially when dealing with large volumes of data or complex topics. Here are a few ways ChatGPT can be used for information collection:

(1) Data Mining: ChatGPT can be used to mine large datasets for specific information, such as keywords or trends. This can be especially useful in fields like marketing or finance, where there is a need to analyze large volumes of data to make informed decisions.

(2) Literature Review: ChatGPT can be used to assist in literature reviews, helping researchers to quickly identify and collect relevant articles and studies on a particular topic. This can save time and effort, allowing researchers to focus on analyzing and synthesizing the information they collect.

(3) Customer Feedback: ChatGPT can be used to collect and analyze customer feedback, providing businesses with valuable insights into customer preferences, pain points, and behaviors. This can be used to inform product development, marketing strategies, and customer support initiatives.

(4) Social Media Monitoring: ChatGPT can be used to monitor social media channels for mentions of a brand or product, providing businesses with real-time feedback on how their products and services are being received. This can be used to make adjustments to marketing and product strategies, and to address customer concerns in a timely manner.

Thus, ChatGPT can be a powerful tool for information collection, providing businesses and researchers with a way to quickly and efficiently collect and analyze large volumes of data. As the technology continues to evolve, we can expect to see new and innovative applications emerge, further enhancing the capabilities of ChatGPT for information collection.

In academics, ChatGPT can also be a useful tool for academic information collection, particularly for literature reviews and research. Here are some ways ChatGPT can be used in academic information collection:

(1) Literature Reviews: ChatGPT can assist researchers in conducting literature reviews, helping to identify and collect relevant articles and studies on a particular topic. Researchers can input keywords or phrases related to their research question, and ChatGPT can generate a list of relevant sources.

(2) Citation Searches: ChatGPT can help researchers to find additional sources related to a particular citation or author. By inputting the citation information or author name, ChatGPT can generate a list of related sources, allowing researchers to quickly and easily expand their research.

(3) Reference Checking: ChatGPT can be used to check the accuracy and completeness of references in academic papers. Researchers can input the citation information, and ChatGPT can provide information about the source, including author, publication date, and other relevant details.

(4) Information Retrieval: ChatGPT can be used to retrieve information on a wide range of academic topics, including research methods, theories, and case studies. Researchers can input questions related to their research, and ChatGPT can provide relevant information and resources.

Thus, ChatGPT can be a valuable tool for academic information collection, helping researchers to quickly and efficiently collect and analyze relevant information. As the technology continues to evolve, we can expect to see new and innovative applications emerge, further enhancing the capabilities of ChatGPT for academic research.

6. CHATGPT AS QUASI VIRTUAL LIBRARY :

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ChatGPT can be used as a quasi-virtual library by providing users with access to a vast array of information and resources [26]. Here are some ways ChatGPT can be used as a quasi-virtual library:

(1) Accessibility: ChatGPT can be accessed from anywhere with an internet connection, making it a highly accessible source of information. This can be particularly useful for individuals who may not have access to a physical library or who need to access information quickly.

(2) Large Volume of Information: ChatGPT has access to vast amounts of information, including articles, books, and other sources of information. This allows users to quickly find information on a wide range of topics, without needing to physically search through a large number of books or articles.

(3) Personalized Recommendations: ChatGPT can provide personalized recommendations based on a user's interests and past search history. This can help users to discover new sources of information that may be relevant to their research or interests.

(4) Instant Responses: ChatGPT can provide instant responses to user queries, allowing individuals to quickly find the information they need. This can be especially useful for time-sensitive research projects or for individuals who need information quickly.

(5) Information Retrieval: ChatGPT can provide users with access to a wide range of information, including books, articles, and other resources. Users can input their queries and ChatGPT can generate a list of relevant sources.

(6) Reference Checking: ChatGPT can be used to check the accuracy and completeness of references in academic papers, providing users with information about the source, including author, publication date, and other relevant details.

(7) Research Assistance: ChatGPT can assist users in conducting research by providing access to a wide range of resources and assisting with literature reviews, citation searches, and other research-related tasks.

Hence, ChatGPT can be a powerful tool for information access and discovery, providing users with a quasi-virtual library experience. As the technology continues to evolve, we can expect to see new and innovative applications emerge, further enhancing the capabilities of ChatGPT as a quasi-virtual library.

7. CHATGPT AS UNIVERSAL LIBRARY :

ChatGPT has the potential to serve as a universal library, providing users with access to a vast array of information and resources from various fields and domains. It can be used for:

(1) Multilingual Support: ChatGPT can provide access to information in multiple languages, making it easier for users to find information in their preferred language.

(2) Cross-Disciplinary Access: ChatGPT can provide access to information from various fields and domains, allowing users to explore and learn about new topics and subjects.

(3) Accessibility: ChatGPT can be accessed from anywhere with an internet connection, making it more accessible to users who may not have access to traditional libraries or resources.

(4) Personalization: ChatGPT can provide personalized recommendations based on a user's preferences and interests, helping users to discover new resources and information.

(5) Access to Diverse Information: ChatGPT can provide users with access to information from a variety of sources and disciplines, including academic research, news articles, and multimedia content.

(6) Customizable Preferences: ChatGPT can be customized to reflect a user's interests and preferences, providing personalized recommendations and information.

(7) Continuous Learning: ChatGPT is constantly learning and improving its capabilities, meaning that its knowledge base is constantly expanding. This makes it a valuable resource for users who need access to the latest information and research.

Thus, ChatGPT has the potential to serve as a universal library, providing users with access to a vast array of information and resources from various fields and domains. As the technology continues to evolve, we can expect to see new and innovative applications emerge, further enhancing the capabilities of ChatGPT as a universal library.

While university libraries are an important resource for students and researchers, there are some limitations to their use when compared to ChatGPT. Such limitations of university libraries include:

(1) Limited Access: University libraries can be limited in terms of the number of resources they offer and their availability. This can be particularly problematic for students and researchers who require access to a wide range of resources, particularly those that are not available locally.

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(2) Limited Resources: Digital libraries may be limited in terms of the number of resources they offer, particularly if they are curated by a single institution or organization. This can be particularly problematic for students and researchers who require access to a wide range of resources.

(3) Time and Location Constraints: University libraries are typically only open during certain hours and may be limited in terms of their physical locations. This can make it difficult for students and researchers to access the resources they need, particularly if they are studying remotely or have limited time available.

(4) Language Barriers: University libraries may not have resources available in all languages, making it difficult for non-native speakers to access information and research from around the world.

(5) Human Bias: University libraries are typically curated by human librarians, who may have their own biases and preferences when it comes to selecting resources. This can result in a limited range of resources being available, particularly if the librarian is not familiar with a particular subject area or topic.

Hence, ChatGPT can provide users with access to a vast array of information and resources from across the globe, with no time or location constraints. ChatGPT also has the ability to understand and respond in multiple languages, making it a valuable resource for users who speak different languages. Additionally, ChatGPT is not subject to human bias and can provide users with a broader range of resources and recommendations. However, it's important to note that ChatGPT is not a replacement for university libraries, but rather a complementary tool that can enhance the research experience for students and researchers.

8. EFFECT OF AI-BASED GPTS ON HE LIBRARY SYSTEM :

The advent of AI-Based GPTs (Generative Pre-trained Transformers) is having a significant impact on the Higher Education (HE) Library System. Ssome of the effects of AI-Based GPTs on HE Library System are listed below:

(1) Increased Efficiency: AI-Based GPTs can automate many library tasks, such as cataloging, sorting, and searching, which can save time and increase efficiency for librarians and users. This allows librarians to focus on more complex tasks and improve the overall library experience for users.

(2) Improved Access to Information: GPTs can provide users with instant access to a vast array of information and resources from across the globe. This can greatly enhance the research experience for students and researchers, as they can quickly find the information, they need without having to physically search through stacks of books or browse through digital libraries.

(3) Personalized Recommendations: GPTs can analyze a user's search history and provide personalized recommendations based on their interests and needs. This can help users discover new resources and information that they may not have otherwise found on their own.

(4) Increased Collaboration: GPTs can facilitate collaboration among researchers and students by providing a platform for sharing information and resources. This can help to break down silos and promote interdisciplinary research and learning.

(5) Enhanced Accessibility: AI-Based GPTs can provide more personalized recommendations and search results based on the user's preferences and history, making it easier for users to find relevant information quickly. Additionally, AI-Based GPTs can be programmed to understand and respond in multiple languages, making information more accessible to non-native speakers.

(6) Improved User Experience: AI-Based GPTs can provide users with a more interactive and engaging experience, with the ability to ask questions and receive personalized recommendations in real-time. This can enhance the overall library experience for users and encourage them to use the library more frequently.

(7) Greater Data Insights: AI-Based GPTs can analyze user data and provide librarians with insights into user behavior and preferences, which can help librarians make better decisions about library resources and services.

(8) Challenges to Privacy and Security: The use of AI-Based GPTs can raise privacy and security concerns, particularly if user data is being collected and analyzed. Libraries will need to ensure that they have appropriate safeguards in place to protect user privacy and secure user data.

(9) Challenges to Traditional Library Systems: While GPTs can enhance the research experience for users, they may also pose challenges to traditional library systems. As GPTs become more sophisticated and user-friendly, they may be seen as a more convenient alternative to traditional library systems.

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Hence, AI-Based GPTs have the potential to significantly improve the HE Library System, by enhancing efficiency, accessibility, user experience, and data insights. However, librarians and library systems will need to carefully consider the potential risks and challenges associated with the use of AI-Based GPTs, and implement appropriate measures to mitigate them.

9. COMPARISON OF CHATGPT WITH PHYSICAL LIBRARY :

There are several ways in which ChatGPT, as an AI language model, can be compared to a physical library. Here are some key differences and similarities:

(1) Access to information: One of the main benefits of a physical library is that it provides access to a wide range of books, journals, and other resources. Similarly, ChatGPT has access to a vast amount of information and can provide answers to a wide range of questions.

(2) Availability: ChatGPT is an online resource that is available 24/7, while physical libraries have set hours of operation and may not be accessible outside of those hours.

(3) Scope of information: ChatGPT has access to vast amounts of information from a variety of sources, while physical libraries are limited by the physical books and materials they have in their collection.

(4) Expertise: ChatGPT is a machine learning model trained to understand and respond to natural language, while physical libraries may have subject-matter experts available to provide guidance and advice.

(5) Speed: ChatGPT is capable of processing and providing responses to questions much faster than a physical library. While it may take some time to locate a specific book or article in a physical library, ChatGPT can provide an answer almost instantly.

(6) Accuracy: Physical libraries are generally considered to be highly accurate sources of information, as they are often curated by trained professionals. Similarly, ChatGPT has been trained on large amounts of high-quality data and is capable of providing accurate answers to many questions.

(7) Bias: One potential drawback of physical libraries is that they may be subject to bias, as the selection of books and resources may be influenced by the opinions and perspectives of the librarians. Similarly, ChatGPT may be subject to bias depending on the data it was trained on.

(8) Interaction: Physical libraries provide an opportunity for interaction with librarians and other patrons, which can be helpful in finding information and developing research skills. Similarly, ChatGPT provides an interactive experience where users can ask questions and receive answers in real-time.

(9) Limitations: While ChatGPT can provide answers to a wide range of questions, it is not a replacement for the depth and breadth of information available in a physical library. Additionally, physical libraries may provide access to physical resources such as rare books and manuscripts that cannot be accessed through ChatGPT.

Thus, while both ChatGPT and physical libraries serve important roles in providing access to information, they have different strengths and weaknesses. ChatGPT is particularly useful for providing quick and targeted responses to specific questions, while physical libraries can provide more comprehensive information and may have subject-matter experts available for guidance.

10. COMPARISON OF CHATGPT WITH DIGITAL LIBRARY :

ChatGPT and digital libraries are both online resources that provide access to information, but they differ in some key ways. Some comparisons between ChatGPT and digital libraries:

(1) Type of content: ChatGPT is an AI language model that can answer specific questions and provide information on a wide range of topics. Digital libraries, on the other hand, typically offer a more extensive collection of e-books, journals, and other digital resources.

(2) Searchability: ChatGPT relies on natural language processing to understand and respond to user queries, while digital libraries typically rely on keyword searches to locate relevant content.

(3) Interactivity: ChatGPT is interactive, allowing users to ask specific questions and receive targeted responses. Digital libraries, while also providing access to information, may not offer the same level of interactivity and may require users to navigate through different resources on their own.

(4) Scope of Information: ChatGPT has access to vast amounts of information from a variety of sources, while digital libraries are typically limited to digital versions of physical books and materials.

(5) Speed: ChatGPT can provide answers to questions quickly, often within seconds or minutes, while digital libraries may require more time to locate and retrieve information.

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(6) Access: ChatGPT is often freely available online, while digital libraries may require a subscription or membership to access certain resources.

(7) Expertise: ChatGPT is an AI language model trained to provide responses based on the patterns and relationships learned during pre-training and fine-tuning. Digital libraries may provide access to subject-matter experts or other resources that offer more specialized and comprehensive information. Thus, ChatGPT is particularly useful for providing quick and targeted responses to specific questions, while digital libraries can provide more comprehensive information and may have subject-matter experts available for guidance. Both resources can be valuable for accessing information, and the choice of which to use may depend on the specific needs of the user.

11. SWOC ANALYSIS OF CHATGPT BASED INFORMATION SYSTEM COMPARED TO PHYSICAL LIBRARIES IN HE INSTITUTIONS :

SWOC analysis is a strategic planning tool that helps to identify and analyze the strengths, weaknesses, opportunities, and threats of a particular entity or system [27-28]. Here's a SWOC analysis of ChatGPT-based information system compared to physical libraries in HE institutions:

Strengths:
(1) ChatGPT can provide users with instant access to a vast array of information and resources from across the globe.
(2) ChatGPT can provide personalized recommendations based on the user's interests and needs.
(3) ChatGPT can quickly process and analyze vast amounts of information, making it easier for users to find the information they need.
(4) ChatGPT can facilitate collaboration among users by providing a platform for sharing information and resources.
(5) Increased efficiency in managing and searching through information.
(6) Reduced costs associated with physical infrastructure and maintenance.

Weaknesses:
(1) ChatGPT relies on internet connectivity and may not be accessible in areas with poor connectivity.
(2) ChatGPT may not be able to provide physical resources such as books, manuscripts, and rare collections.
(3) Limited availability of certain resources, such as rare or out-of-print books.
(4) Reliance on technology and potential for technological failures or glitches.
(5) Potential for biases or inaccuracies in AI algorithms and recommendations.
(6) Lack of physical presence and opportunities for face-to-face interaction with librarians and other users.

Opportunities:
(1) ChatGPT can help HE institutions to reduce the cost of maintaining physical libraries.
(2) ChatGPT can help HE institutions to increase the accessibility of information to users who are not physically present on campus.
(3) ChatGPT can facilitate the creation of a digital repository of resources that can be accessed by users from anywhere in the world.
(4) Integration with existing library systems to enhance the user experience.
(5) Development of new AI-based technologies and applications to further improve access to information.
(6) Increased collaboration and interdisciplinary research among users.

Challenges :
(1) ChatGPT may pose a threat to traditional library systems, which may become obsolete as users increasingly turn to digital resources.
(2) The quality of information provided by ChatGPT may not be as reliable as that provided by traditional library systems.
(3) ChatGPT may pose a threat to the privacy and security of user information.
(4) Potential for job losses among librarians and other library staff.

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(5) Competition from other AI-based information systems and technologies.

(6) Resistance from users who prefer traditional library systems or who are hesitant to embrace new technologies.

Thus, the SWOT analysis shows that ChatGPT-based information systems have many strengths and opportunities, but also face some weaknesses and threats. It's important for HE institutions to carefully consider these factors when integrating ChatGPT-based information systems into their existing library systems, and to ensure that they are working to mitigate potential weaknesses and threats.

12. SUGGESTIONS AND PRECAUTIONS FOR USING AI-BASED GPTS FOR ACADEMIC INFORMATION RETRIEVAL :

Based on above analysis, some suggestions and precautions are noted and listed for using AI-based GPTs for academic information retrieval:

Suggestions:

(1) Use multiple sources to verify the accuracy of information obtained from GPTs, particularly when working on research projects.

(2) Keep up-to-date with advancements in GPT technology to ensure that you are utilizing the most accurate and efficient systems available.

(3) Utilize features that allow for customization and personalized recommendations based on user search history and interests.

(4) Take advantage of collaboration tools available through GPTs to facilitate teamwork and knowledge-sharing among researchers and students.

(5) Use GPTs to supplement, rather than replace, traditional research methods such as visiting physical libraries or consulting with librarians.

Precautions:

(1) Be aware of potential biases or inaccuracies in GPT algorithms and recommendations, particularly with regards to controversial or sensitive topics.

(2) Consider the privacy and security implications of utilizing GPTs, particularly when working with confidential or proprietary information.

(3) Ensure that the GPT is properly integrated with existing library systems to avoid duplication or loss of information.

(4) Be mindful of the potential for technological failures or glitches, and have backup plans in place to ensure continuity of work.

(5) Remember that GPTs are tools, and should not be relied upon as the sole means of information retrieval or research.

By following these suggestions and taking necessary precautions, researchers and students can effectively utilize AI-based GPTs for academic information retrieval, while also ensuring the accuracy and security of their work.

13. CONCLUSION :

In conclusion, the implementation of AI-based ChatGPT technology in higher education libraries has both positive and negative effects. On the positive side, ChatGPT can provide quick and accurate answers to student queries, freeing up staff time for more complex tasks. It can also help to expand the reach of the library, making it more accessible to students outside of regular hours.

However, there are also some negative effects to consider, such as potential job losses for library staff and concerns around privacy and security when using AI-based technology. Additionally, ChatGPT may not be able to provide the same level of personalized assistance as human staff, which could impact the overall quality of the student experience.

Thus, it is important for higher education libraries to carefully consider the implementation of ChatGPT technology and weigh the benefits and drawbacks. While it has the potential to improve efficiency and accessibility, it is important to balance these benefits with potential negative impacts on staff and student experience. By taking a thoughtful and strategic approach to the implementation of ChatGPT, higher education libraries can maximize the benefits of this technology while minimizing potential negative impacts. It can be argued that ChatGPT-based AI systems can be compliments instead of replacements of entire physical and digital library systems).

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