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# IMPACT OF ARTIFICIAL INTELLIGENCEON EDUCATIONAL RECOMMENDATIONS

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**ABSTRACT :** Global adoption of online tools in education is transforming the teaching and learning process. The evaluation showed users' acceptance of extracted information about their educational interests, automatically generated from social networks and enriched to find implicit claims. Several educational resources are distributed in different repositories that address various subjects and educational goals. The constant and ever-increasing use of social networks allows the identification of additional information about profiles, interests, preferences, styles, and behaviour from spontaneous interaction. To generate personalized recommendations, it is essential to identify information that will help to define a user profile and assist in determining an individual's interests. It is based on the relevance of an algorithm for analysing predictions. Technology-enhanced learning (TEL) aims to design, develop and test socio-technical innovations that will support and enhance the learning practices of individuals and organizations.

***Keywords :*** Artificial intelligence, recommender system, pedagogy, algorithms

## I. Introduction :

In the world of information density and product overload, a recommendation engine provides an efficient way for companies to provide consumers with personalized information and solutions. A recommendation system is one trend that suggests products and services and leads users. Recommendation systems are quickly becoming the primary way for users to expose to the whole digital world through the lens of their experiences, behaviours, preferences, and interests(Katkar S.V et al., n.d.) On the Internet, where the number of choices is overwhelming, there is a need to filter, prioritize and efficiently deliver relevant information to alleviate the problem of information overload, which has created a potential problem for many Internet users. Prediction techniques in recommendation systems serve as a compass for research and practice in recommendation systems. In the world of information density and product overload, a recommendation engine provides an efficient way for companies to provide consumers with personalized information and solutions. Recommender systems solve this problem by searching through a large volume of dynamically



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generated information to provide users with customized content and services(Mendagudli, M. G. et al., n.d.). The users can minimize the cost of choosing the most suitable product in the context of internet shopping. The technology suggests the most appropriate content for its users and matches their preferences. It uses different sources of information to provide users with predictions and recommendations of items. Digital businesses need to improve their performance through the implementation of recommender systems. Collaborative Filtering algorithms play a vital role in the request, although they are often used along with other filtering techniques like content-based, knowledge-based or social. Evaluation of the predictions and recommendations has evolved since the origins of recommender systems. (Algabri, H. K 2021)

**II. Framework of Recommendation System :**

One of the crucial components behind a product recommendation engine is the recommender function, which considers specific information about the user and predicts the rating that the user might assign to a product. The ability to predict user ratings, even before the user has provided one, makes recommender systems a powerful tool. Although most of the big giants use machine learning and Artificial intelligence models to build their recommendation systems, more straightforward approaches are also possible. Driven by an orchestration layer, the recommendation engine can intelligently select which filters and algorithms to apply in any given situation for a specific customer.

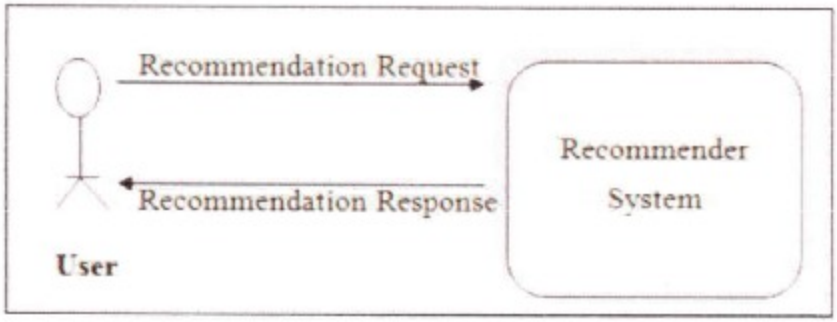


**Fig.1 : Interaction with Recommender System**

Computational tools are increasingly present in information access, both by conducting formal classes supported by technologies or in daily people's life searching for non-formal educational content.(Varnika and Kulvinder Singh, 2020)Many educational resources are distributed in different repositories that address a wide range of content and subjects that can supply information to individuals or groups on the Web.



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## III. Scope of Recommender Systems in Education :

Teachers have reported that they wish to receive recommendations for resources or people based on their preferences, and goals and search topics or suggestions for resources other teachers found interesting and useful. Recommender systems are guides that can help teachers find solutions to their documented needs in a context where teachers are responsible for their professional development. It includes academic choices, learning activities, learning resources, and training. It follows content-based, collaborative, or hybrid approaches for implementation. It has different formats like desktop-based, web-based or mobile-based, etc.

In the online learning ecosystem, we envision a scenario wherein the educational platform should guarantee that a set of learning principles are met for all the learners, to a certain degree, when generating recommendations according to the learner's interests. Therefore, the ideal recommender system would predict individual interests based on collected data and analysis. Characterizing and counteracting potential pitfalls of data-driven educational interventions is receiving increasing attention from the research community. The recommendation systems can be used to support main areas in education, what approaches, techniques, or algorithms recommender systems use, and how they address different issues in the academic world. Moreover, this work has also helped detect some research gaps and key areas where the further investigation should be performed, like the introduction of data mining and artificial intelligence in recommender system algorithms to improve the personalization of academic choices.

Developing a recommender system using a genetic algorithm (Mirko Marras et al., 2021)often has problems and open questions that must be evaluated so software engineers know where to focus research efforts. The use of genetic algorithms in recommender systems identifies research opportunities for software engineering research. Recommended learning opportunities, according to the platform principles, context, and pedagogy Various issues are related to recommender systems that use AI, (Deschênes, M. 2020) and also reviews the improvements made to these systems through the use of such AI approaches as fuzzy techniques, transfer learning, genetic algorithms, evolutionary algorithms, neural networks and deep learning, and active learning. Artificial intelligence (AI), particularly computational intelligence and machine learning methods and algorithms, has been naturally applied in developing recommender systems to improve prediction accuracy and solve data scarcity and cold start problems.

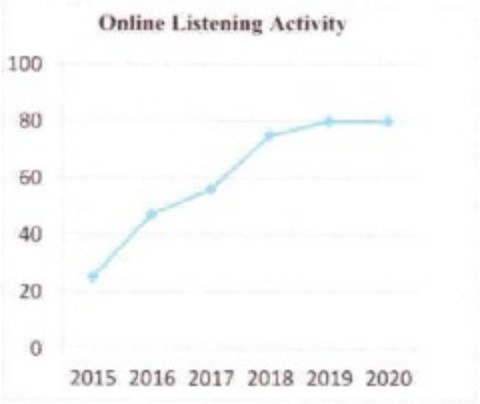
It has been a new era for recommender systems, creating advanced insights into the relationships between users and items, presenting more complex data representations, and discovering comprehensive knowledge in demographical, textural, virtual, and contextual data. These continuing advances in AI, data



analytics, and big data present a great opportunity for recommender systems to embrace the impressive achievements of AI. Various AI techniques have recently been applied to recommender systems, helping to enhance the user experience and increase user satisfaction with a self-determined approach. The recommended approach is based on learning object repositories, linked data, and video repositories (Blaschke, L.M. ,2017).

**IV. Pedagogical Changes in Education :**

A study published by eSchool News indicates that by 2021, the application of AI in education and learning will be increased by 47.5%. Students, learners, school leaders, and curriculum designers are the main stakeholders of the education system. The impact of this technology will be felt from the lowest education levels through higher learning institutions. This will create adaptive learning techniques with customized tools for improving the learning experiences. With more inventions, there will be a wider range of courses available online, and with the help of AI, students will be learning from wherever they are. Technology brings drastic transitions by facilitating the learning of any course from anywhere, globally, and at any time. It provides personalized learning to the trainers (Patil, B. P,2020). It also helps to generate smart content. It helps with grading, tutoring, analytics, etc. It supports formal and non-formal education. Artificial Intelligence can make connections across these different data points to provide predictions of future outcomes to enable course corrections in near-real-time and to derive insights that will allow all stakeholders to make more informed decisionsthat constitute its power and its promise. None of these challenges can be met with data alone. We can show a percentage increase in online listening and reading activities. Once you refer to a source, the system recommends relevant reading and listening resources. (Katkar, S. V.et.al 2020)



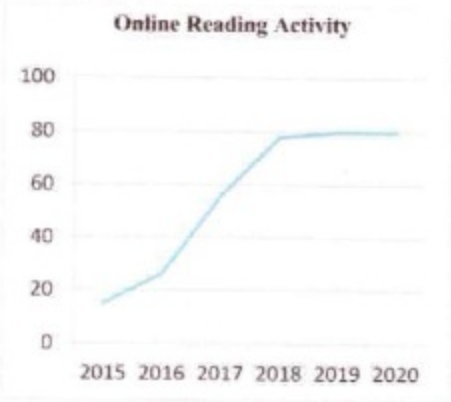



**Fig.2 : Measurement of year-wise progress Use of Educational tools**

Earlier, for the teaching-learning process, a teacher-centred approach was followed. A teacher decided all the details. There was less scope for students' suggestions. But today, the picture has changed. So, student-cantered pedagogy is followed. System provides guidelines based on recommendations. (Rivera, A.C.1970)

Comparison of Change in pedagogy has been explained with the help of a pseudo code,

**Teacher-centered pedagogy**

```
START
    Assign roll no
      Discuss topics
      Evaluation
END
```

**Student-centered pedagogy**

```
START
      Create or Update Profile
Select level
      If level = beginner
            Then
            Recommend beginner activities
      Else
            Recommend advance activities
      END
```

Artificial intelligence has a higher impact on pedagogy. According to most experts, the presence of teachers is irreplaceable; there will be many changes to a teacher's role and technology for teaching and learning.

For recommendations, the collaborative filtering approach is more relevant. Current research facilitates recommendations for the education field and specializes in foreign language learning (Albatayneh, N. A.2018)

Based on a learner's skill set and interest, by referring collaborative algorithm, requests will be made for language improvement.



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**V. Value Addition in Technology for Recommendations :**

As the recommendation tasks are getting more diverse and the recommending models are growing more complicated, it is increasingly challenging to develop a proper recommendation system that can adapt well to a new recommendation task. In this tutorial, we focus on how automated machine-learning techniques can benefit the design and usage of recommendation systems (Pereira, C.K. et al. 2018). Then, we elaborate more on three important topics under such a scope, i.e., feature engineering, hyper parameter optimization/neural architecture search, and algorithm selection. Present recommendation schemes such as content-grounded filtering and collaborative filtering practice dissimilar databases to create references. Content-based filtering can recommend a new item but requests more data on customer preference to include the finest match. Like, collaborative filtering wants a huge dataset with lively customers who valued a product before to create precise predictions. (Chougale, N.P. et al. 2021) Collaborative filtering mimics user-to-user recommendations. Content-based filtering creates recommendations built on customer favourites for product types. The interpretability discussion of the recommendation algorithm is generally the selectionprocess after the algorithm evaluation (Bauman, K.et.al 2018) With the high demands of users, the research of recommendation reasons has received more and more attention in industry and academia. Since information retrieval is a pivotal activity in the educational system, the deployment of recommender systems has attracted increased interest. (Prathima, Ch.2022)

**Conclusion :**

Artificial intelligence provides many ways for effectiveness in the education field. The use of the online mechanism is increasing consistently. It also helps to alleviate the problem of information overload, a very common phenomenon with information retrieval systems and enables users to access details and services that are not readily available to users on the system. Various algorithms are responsible for the performance of the recommender systems.AI recommender systems help academic achievement and improve learners' engagement in learning tasks and recommend details for achieving learners' goals.

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