New Ecology of AI-Assisted Language Education

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Abstract: AI-Assisted education is building new ecology in education: less cost, more efficient and more equal. Compared with traditional foreign language education, AI-Assisted foreign language education costs less, incite learners' interests and improve efficiency. With the improvement of language level, the country embraces great discursive power.

1. Introduction
The economic attributes of foreign languages make them a good investment with high return rate. It is estimated that the return rate of foreign language learning in urban labor is about 70%. It is clearly seen that foreign language learning contributes to the improvement of workers' income [1]. Being conscious of this, both education providers and receivers invest heavily on foreign languages to achieve a higher rate of return. According to a survey from Gao Yuan, Liu Huan (2017), more than half of the interviewees spent 500-1500 yuan per month on foreign language training for their kids in Hebei province in the northern part of China, 28% of them spent more than 1, 500 yuan per month. And 70% of them thought that the training costs are too high [2]. Although the effect of foreign language education is satisfactory, high expenses on foreign language planning is a common problem in most of urban families worldwide. The cost of foreign language learning includes not only money, but also time and energy. Benefits include improved learning results (such as getting higher test scores, passing exams), emotional achievement (such as psychological satisfaction, and increased learning interest).

2. Costs and benefits analysis

2.1. Cost analysis.
In the context of artificial intelligence empowered education, its costs and benefits have changed. Traditionally, the cost of foreign language education includes labor (educator) costs, textbook development and publishing costs, teaching venues investment. For the learners, they need to pay extra time traveling to and from the learning venue. Artificial intelligence can greatly reduce costs above.

Unlike traditional foreign language education, the largest cost for AI-based education lies in the early development of resources and the maintenance costs in the later period, which is short-term. Furthermore, Smart resources, intelligent identification and intelligent diagnosis, can be used repeatedly without increase of cost, while traditionally, it is more like a one-time consumption. Hardly could it be possible to invest one-time and make use of all the resources repeatedly in a long period. The update of language knowledge is relatively slow, and the change of language rules takes a certain time, except for the appearance of some latest new words, which does not affect language learning and use too much. Therefore, the developed smart resources can be used for a relatively long time, and the maintenance cost keeps comparatively stable. Of course, the situation of language testing is a bit more complicated.
The total amount of tests required for virtual testing is 12 times that of paper-based test paper. However, compared with the unified tests which costs much on labor force, printing and test venues, the manpower and material resources required for the development of test papers are significantly lower. Investment may be large in the early stage, the saved manpower and material resources in the testing process and evaluation work after tests are obvious.

2.2. Benefit analysis.
In AI-based foreign language education, both the education provider and the learner have benefited a lot. The benefit of learners mainly comes from the improvement of foreign language ability and the experience of learning satisfaction.

Researches in China shows that with the aid of AI, learning experience is highly satisfied [3]. Since smart resource are not limited by time and place, and are more in line with learners’ individual situations, it will better stimulate their interest in learning [4]. Chatterbots based on dialogue management and developed with AI can engage learners actively in conversation, opening new horizons for spoken language teaching/learning [5]. it is quite reasonable to conclude that artificial intelligence will enhance learners' foreign language ability. Adult learners can earn personal dividends by improved language ability, adding it to human capital, making a better employability, better working environment, and higher labor compensation. For individuals who are underage learners, enhancement in foreign language proficiency means better learning opportunities and a higher starting point.

Resource developers (such as website and APPs developers) can also benefit from AI-based education. A certain number of users of these resources can bring considerable economic benefits to the developers, such as membership fees and advertising revenue. Most of the developers have strong financial and technical backgrounds, such as IFLYTEC, a leading company of AI technology in China, and Google in America.

Furthermore, in the long run, the country is the largest beneficiary of language dividends. In 1971, Thorburn described language costs and benefits at the national level [6]. The cost of language education can be measured in terms of money, while the benefit for a country whose value cannot be measured in terms of currency. In the process of globalization, the improvement of foreign language proficiency of citizens can promote the economic development of a country such as international trade, enhance cultural communication and build up more positive image of a nation. It is also helpful in building a culturally powerful country, strengthening cultural soft power, and raising international discourse. Better communication, better development, this concept should be ironed into a nation’s soul. So, the conclusion can be drawn that the country reaps the longest and largest language dividend in AI-assisted foreign language learning.

3. Efficiency - Fairness analysis
The ultimate goal of education is to promote fairness and improve learning. And the sustainable development of education requires fair quality education, making sure that every learner has equal access to it. Artificial intelligence provides technical support for the realization of this goal. People from different regions (especially in remote areas have fair learning opportunities), ethnic groups, no matter how old or what gender they are, equally share learning opportunities.

Educational equity includes fairness at the starting point, during the process, and in results. Artificial intelligence assisted learning can guarantee the supply of education, eliminating inclination of educational resources towards developed area, achieving fairness at the starting point. Personalized learning analysis and guidance will ensure the fairness of the learning process, through which students get personalized development, making fair educational results.

3.1. Equity in educational starting point.
There are significant differences in education between urban and rural areas in places where education is a scarcity. With resources concentrated in urban areas, it is difficult for learners from rural areas to get qualified education, which is not only reflected in the convenience and availability of learning resources
outside the school, but also in the qualified teachers.

Sharing high-quality educational resources, exerting its spillover effect, AI-assisted foreign language education can break through geographical restrictions and achieve equity in starting point. Take MOOC for example, an informal study platform, combined with AI, it enables learners in remote rural areas to study Harvard open classes at home through smart devices, participating in interactions, and enjoying first-rate education resources in the world

3.2. Equality in educational process.
Based on the big data and learning analysis technology, learning content can be customized for different learners, and the learning results can be personalized and diagnosed to meet the individual needs. Intelligent identification of image, text, and voice can recognize input objects indifferently. Machine makes the most rational judgments regardless of the learners age, color of skin, being poor or rich. Artificial intelligence learning software and websites have been widely used in China in and out of the classroom, receiving sound feedback. Artificial intelligence is a rational tutor, lessening workload for teachers, improving work efficiency. In addition, it can exclude interferences of other irrelevant factors such as learners' attitudes, personality, family background, handwriting, achieving equity in educational process.

3.3. Fairness in educational results.
This term refers to the fact that the educated person can obtain the education compatible with individual's ability, so that his ability and personality can be developed accordingly, the potential effectively excited, balancing their input and outcome of education. Learners can release potential through personalized learning, avoiding situations in which learning ability is lower than potential due to external reasons such as learning resources and teachers. Meanwhile, virtual learning community constructed by AI technology and the learning platform enable learners to get more opportunities in study and academic qualification. The implementation of the MOOC credit certification system, network continuing education and training offer learners' better chance of getting diploma and certificates, promoting equity of education results to a certain extent.

As is described above, the new eco-system of education is achieved, as is shown in the picture below:

Picture1: New eco-system of education
The sharing of smart resources and improvement of personalized learning assisted by artificial intelligence have laid a solid foundation for education fairness. AI-based new models of learning such as ubiquitous learning, personalized learning and virtual community can maximize learning time and
space, leading to improved learning efficiency, which will lead to the overall improvement of language level, thus increasing the country’s discursive power. So, as a whole, education providers, learners and the country all benefit from new technology, forming a new eco-system of education.

4. Conclusion

AI-supported education is the general direction of future life. With a short-term investment, it will reap long-term benefits, greatly reducing the cost of learners and education providers, and improving efficiency. It is a short cut to achieve educational fairness and efficiency. Smart resources, intelligent diagnostic assessment, and virtual learning communities, all these combined together can effectively guarantee education supply, lower education costs, improve efficiency and promote educational equity. AI-based learning is building new eco-education system with education providers, learners and education bureaus reaping dividends together.

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