Impact of Artificial Intelligence Assisted Approach on English

Teaching and Learning

Huimin Zhu   Fuangfa Amponstira
Ph.D. Candidate, Management, School of Management, Shinawatra University.
Ph.D Management, School of Management, Shinawatra University.
Email : mariazhugood@foxmail.com

Abstract

The research objectives are to study the impact of artificial intelligence assisted approach on English teaching and learning. The research is mixed method of qualitative and quantitative research. Quantitative research investigations applied pilot study, case study in Qiannan Normal Universities for Nationalities in Guizhou Province in China, and overall investigation from universities in China. Data collecting method is carried out by adopting China's most reliable and academic research website wjx.cn. In qualitative research, semi-constructed interview is conducted in Qiannan Normal Universities for Nationalities in Guizhou Province in China. The research employs ANOVA analysis, reliability analysis, regression analysis and other necessary analysis methods to assess the variables and to test hypothesis. Findings in researches from the respondents' perspective show that artificial intelligence assisted approaches are functioning as promoter for English teaching and learning and acting as a tester for source of classroom data and assessment in terms of classroom performance. The significance of the research is to advocate educational innovation and reform focusing on the development of an educational model of "teaching, learning, examination, evaluation, and management" to promote the integration of technology and educational scenarios and further promote the empowerment of smart education. What's more, the way out is to take education informatization as an endogenous variable of educational systemic changes to promote the development of artificial intelligence in assisting education. The measures to take is for education research to create different models

for smart education in running schools of AI with different characteristics based on their geographical location, economic condition, cultural advantages and physical resources advantage.

Keywords: Artificial intelligence teaching, learning activities, impact, analysis

Introduction

The present state of artificial intelligence in language teaching and learning is at a new searching and testing period in different fields and areas, such as program processing, speeding teaching and learning production, and high efficiency in teaching and learning performance evaluation analysis and teaching and learning assessment system perfection. Benefits are bountiful in educational services improvement, providing more vivid learning environments, reducing students' learning pressure, providing accurate test and exam evaluation system, reducing teaching and learning costs, shortening learning and teaching production, helping AI in establishing formative assessment system and designing better tutoring courses.

Based on Lei C.(2020)'s speech at the 27th Annual Academic Conference of China Education and Research Computer Network, a policy of free adjustment of access bandwidth during the epidemic has been introduced to college users across the country, and nearly 500 colleges and universities have been upgraded to more than 220G for free to ensure the special network needs of colleges and universities during the epidemic.

Online teaching during the epidemic also exposed many problems, including the problem of the information infrastructure, which still needs to be upgraded to support the needs of large-scale online teaching, the problem of the traditional teaching mode, which does not match the teaching requirements in the online context, and the problem of the information literacy level of teachers and students which needs to be further improved. The quality evaluation of online teaching must find practical and feasible methods, and achieving a smooth transition after the epidemic puts forward higher requirements on the school's

governance capabilities.

Objectives of the research

1. to study the impact of artificial intelligence assisted approach on English teaching and learning.

Literature review

Researches on Theories and Applications of Artificial Intelligence

Coggine A.(2018) believed that the following three key concepts of AI can help understand AI in application work, including machine learning, deep learning and neural network. Dr. Chirapat Ukachoke's research focuses on consciousness and qualia, including the hard problem of consciousness, different qualia, p-zombies, free will, and determinism. The purpose of the findings is to propose ideas about the mind and related matter systematically in the form of a physical theory (Ukachoke, C. 2018).

As Metaxiotis and his colleagues (2006) pointed out, expert systems are becoming increasingly more important in both decision support which provides options and issues to decision makers, and decision making where people can make decisions beyond their level of knowledge and experience. According to McGuire B. (2006), Alan Turing's contribution was that the proposed test provided a strong and useful vision to the field of AI with his pragmatic approach, assuming the existence of 'thinking machines'.

Yang, J.& Zhang. B (2019). Is AI in Intelligent Tutoring Robots research AI in intelligent tutoring robots and provide a systematic review of the recent advances in designing the intelligent tutoring robot (ITR) and summarizes the status quo of applying AI techniques.

Li. C. (2019). Is Research Hotspots in Artificial Intelligence found the main research hotspots in AI in foreign language education in recent years are: knowledge representation and education knowledge photograph; cognitive diagnosis; learner building model; educational test resource characterization; machine reading comprehension and review; intelligent education system; combination of brain science and education.

Popenici S. A. D. & Kerr. S.(2017). Is Artificial Intelligence in Higher Education explored educational implications of emerging technologies on the way students learn and how institutions teach and evolve. It is pinpointed that some challenges for institutions of higher education and student learning in the adoption of these technologies for teaching, learning, student support, and administration and it will be explored further directions for research.

Research Method

This research used both qualitative and quantitative method. For qualitative method, the semi-constructed interview designed a list of 12 key questions relatively connected with artificial intelligence in application in education. The interviewees selected to semi-constructed interview covers the top administrators and experts, middle managers and teachers working at the frontier educational field and the most important source, the students.

Quantitative researches were strictly and rigorously planned and designed into three parts-the pilot study, the investigation research in universities in Guizhou, China and the overall investigation research in universities in China. Pilot study and final investigation were conducted on wjx.com, which is the most reliable, scientific and authorized academic questionnaire investigation website in China. The number of respondents received in pilot study is 151 and 417 in final investigation research. The number of respondents for case study was collected directly from the 9 administrative regions in Guizhou, China, which reached 671 in all.

Semi-constructed interview was carried out mainly in Qiannan Normal University for Nationalities(QNUN, the author's work unit), in Guizhou, China in July, 2020. The people involved were the administrators, managers and experts in charge of the management of artificial intelligence in education in QNUN, teachers from school of AI in QNUN and students who are the education receivers of AI in English teaching and learning.

Summary of Findings in Pilot Study

Pilot study involved 151 respondents. From the percentage analysis of demographic information, 85.43% respondents are female, male takes 14.5%. Most of the respondents are

first year students with a percentage of 35.1%. We also have post graduates with 25.83% and ph.d students with the least percentage of 1.32%.

Most respondents are majoring in English with a percentage of 48.34%. But we also have respondents majoring in science, engineering, agriculture and medicine, who take a proportion of 13.91%, listed No. 3. Statistics show that majority of the students origin are from western China with 52.32%, while students from eastern China ranked the second with 26.49%. And these respondents from western China are attending schools in western universities with the largest proportion of 58.28% and still students from eastern China are studying in universities in eastern China with a percentage of 29.14%.

Among 151 respondents, 120 of respondents' residential area are in towns and only 31 in cities. These statistics show that the differences of residential area will also be different in high technology infrastructure equipment. And the condition for the investigation results will also show the differences.

Questionnaire investigation found that for teaching and learning tasks and activities, when asked about whether AI was used in English teaching and learning, 52.32% reported Yes. As for types of learners, 72.85% responded Yes in terms of learning cooperation in groups. As for type of teachers, the respondents' reflection of the role of teachers found 93.38% agree with the teacher acting as teaching facilitator. As for types of materials, professional and practical course materials received 54.97% agreement. As for teaching performances, respondents' reflection on the use of AI auxiliary means for extracurricular autonomous learning takes a majority of 47.68%. As for students' learning achievements, 49.01% of respondents proclaimed that their final exam results after using the online course during the pandemic have been increased from the original pass line (60 points) up to 81-90 points.

Research results

Findings in Case Study in Guizhou China

Findings in case study in Guizhou, China mainly target on knowledge and attitude

towards applying AI and responses on the impacts of artificial intelligence on ELT.

Findings in Knowledge and Attitude towards Applying AI

Table 1 Findings in Knowledge and Attitude towards Applying AI

Items	t	Sig.
Educational Background	1.869	0.062
Acceptance	11.211	0.000*
Perception of AI	3.62	0.012*
Factor F	-1.816	0.070
Advantage C	5.125	0.000*
Advantage E	2.744	0.006*
Advantage F	5.003	0.000*

Note: sig. < 0.05 *sig. < 0.1(acceptable)

Table 1 summarized the data analysis of case study in Guizhou. It can be seen that the acceptance of AI has significance on the respondents' teaching and learning activities with sig. value = 0.000. At the same level, advantage C, advantage E and advantage F also can directly influence the respondents' teaching and learning with sig. value all = 0.000. Advantage C questions about whether AI can help students achieve personalized learning; advantage E asks about whether AI can use data to help teachers analyze their learning and better teaching; advantage F asks for the respondents' other situations of using AI in their learning. Lastly, it is obvious that clear perception of AI is essential in applying AI in teaching and learning with

sig. value = 0.006.

Findings in Impacts of Artificial Intelligence on ELT

All together, the investigation seeks 23 items for answers. And finally, there are 17 items satisfied with the standard mean score 3.5 and more than the standard mean score. This indicates that among 23 tested items, only 6 items show no significant tendency of agreeing from the respondents. The investigation found that interactive artificial intelligence tutoring activities and voice-driven artificial intelligence activities have impact on English teaching and learning performances and assessments with mean score 3.56 and 3.55. Types of learning style, interest, motivation and attitude have impact on English teaching and learning mean score 3.57, 3.67, 3.62 and 3.66. Types of teacher as facilitator, manager and co-learner have impact on English teaching and learning performances and assessment with mean score 3.5, 3.61 and 3.6. Authentic materials, real materials can impact on English teaching and learning performances and assessment with mean score 3.64 and 3.65.

Findings in Investigation in Overall Universities in China

The investigation objectives are to test whether AI assisted approach teaching and learning tasks and activities (TTA), types of learners (TL), types of teachers (TT) and types of materials (TM) have impact on AI assisted approach teaching and learning performances (TLP) and assessment (TLA). And the research objective aims to prove whether all the above factors can finally impact students' learning achievements (SLA) in their learning activities. The following analysis results indicate to what degree, in which aspects that AI assisted approaches can impact on teaching and learning performances and students' learning achievements.

1.Hypothesis Verification of All Variables on TLP

In order to verify the specific influence of each variables TTA, TL, TT, TM on TLP, each dimension of variable TTA, TL, TT, and TM are tested as independent variables, and TLP is measured as the dependent variable to construct 4 multiple linear regression models for test.

Table 2 Hypothesis Verification of All Variables on TLP

	M1		M2		M3		M4		Hypothesis	Pass/ Fail
	Coefficients	VIF	Coefficients	VIF	Coefficients	VIF	Coefficients	VIF		
TTA1	0.157*** 3.600	2.160							H1a	pass
TTA2	0.047 0.940	2.675							H1b	Refused
TTA3	0.191*** 3.937	2.611							H1c	pass
TTA4	0.134*** 3.289	2.098							H1d	pass
TL1			0.096*** 2.662	2.027					H2a1	pass
TL2			0.128*** 2.916	2.380					H2a2	pass
TL3			0.159*** 3.626	2.307					H2a3	pass
TL4			0.071 1.532	2.418					H2a4	pass
TL5			0.12*** 3.507	1.736					H2a5	pass
TL6			-0.007** -1.778	2.266					H2b	pass
TL7			-0.008 -0.215	1.916					H2c1	Refused
TL8			0.11*** 3.661	1.503					H2c2	pass
TL9			0.041 1.063	2.109					H2c3	Refused
TL10			0.137*** 3.376	1.907					H2d	pass
TT1					0.221*** 3.822	2.365			H3a	pass
TT2					0.036 0.574	2.756			H3b	Refused
TT3					0.077 1.123	3.181			H3c	Refused
TT4					0.259*** 4.275	2.370			H3d	pass

TM1				0.112** 2.068	2.388	H4a	pass
TM2				0.083* 1.706	2.200	H4b	pass
TM3				0.095 1.610	2.708	H4c	Refused
TM4				0.392*** 7.477	2.381	H4d	pass
TM5				0.016 0.273	2.934	H4e	Refused
R2	0.372	0.511	0.311	0.441			
number	414.000	414.000	414.000	414.000			
DW	1.773	1.798	2.058	1.931			
F	60.500	42.120	46.248	64.459			
Sig .	0.000	0.000	0.000	0.000			

Notes：***、**、*respectively represent 1%、5%、10% significance level.

Table 6.1 reports the regression coefficient, significance level, and multicollinearity test results. M1 includes all the variables of types of teaching and learning tasks and activities and shows significance on teaching and learning performances. We can see that R^2=0.372, which means higher model fit with significant value=0.000, D-W value with 1.773, which is close to 2, and VIF are all <5 ;

M2 includes all the variables of types of learners. In the model, R^2 is 0.511 with higher model fit, and significant value is 0.000, D-W value is 1.798, which is close to 2, and the VIF is less than 5. Therefore, this model has good explanatory power;

M3 includes all variables of Types of teachers. In the model, R^2 is 0.311, model fit is high, significant value is 0.000, D-W value is 2.058, which is close to 2, and VIF < 5. To conclude, this model has good explanatory power;

M4 includes all variables in types of materials, among which the model R^2 is 0.441, with a high degree of fitness, the significant value=0.000, D-W value 1.931 being close to 2, and with VIF all <5. From the calculation results, this model has a good explanatory power.

2.Hypothesis Verification of Variables TTA, TL, TT, TM on TLA

In order to verify the specific influence of each variables including types of tasks and activities, types of learners, types of teachers, types of materials on teaching and learning performances, each dimension of variable TTA, TL, TT, and TM are tested as independent variables, and TLA is measured as dependent variable with 4 multiple linear regression models constructed as the following:

Table 3 Hypothesis Verification of TTA, TL, TT, TM on TLA

	M5		M6		M7		M8		Hypothesis	Pass/ Fail
	Coefficients	VIF	Coefficients	VIF	Coefficients	VIF	Coefficients	VIF		
TTA1	0.119*** 2.722	2.160							H5a	pass
TTA2	-0.021 -0.413	2.675							H5b	Refuse
TTA3	0.148*** 3.023	2.611							H5c	pass
TTA4	0.131*** 3.190	2.098							H5d	pass
TL1			-0.006 -0.176	2.027					H6a1	Refuse
TL2			0.116*** 2.675	2.380					H6a2	pass
TL3			0.125*** 2.880	2.307					H6a3	pass
TL4			0.060 1.310	2.418					H6a4	Refuse
TL5			0.093*** 2.758	1.736					H6a5	pass
TL6			0.078* 1.821	2.266					H6b	pass
TL7			0.018 0.493	1.916					H6c1	Refuse
TL8			0.101*** 3.401	1.503					H6c2	pass
TL9			0.041 1.091	2.109					H6c3	Refuse
TL10			0.048 1.188	1.907					H6d	Refuse
TT1					0.190*** 3.778	2.365			H7a	pass

TT2			0.050 0.901	2.756			H7b	Refuse
TT3			0.125** 2.107	3.181			H7c	pass
TT4			0.229*** 4.355	2.37			H7d	pass
TM1					0.269*** 5.861	2.388	H8a	pass
TM2					0.016 0.392	2.200	H8b	Refuse
TM3					0.124** 2.471	2.708	H8c	pass
TM4					0.125*** 2.800	2.381	H8d	pass
TM5					0.179*** 3.547	2.934	H8e	pass
R2	0.236	0.428	0.374	0.518				
DW	1.947	1.941	2.039	1.975				
F	31.665	30.136	61.111	87.774				
Sig .	0.000	0.000	0.000	0.000				
Total		414.000						

Notes：***、**、*respectively represent 1%、5%、10% significance level.

M5 includes all the variables of TTA. In the model, R^2=0.236, model fit is higher, significant value=0.000, D-W value with 1.947 is close to 2, and VIF are all <5, so this model has good explanatory power;

M6 includes all the variables of TL. In the model, R^2=0.428, the model fit is higher. The significant value is 0.000, D-W value is 1.941, which is close to 2, and the VIF is less than 5. So this model has good explanatory power;

M7 includes all variables of TT. In the model, R^2 is 0.374, model fit is high, significant value is 0.000, D-W value is 2.070, which is close to 2, and VIF is less than 5. To conclude, this model has good explanatory power;

M8 includes all TM Variable, among which the model R^2 is 0.518, with a high degree of fitness, the significant value=0.000, D-W value 1.975 being close to 2, and with VIF all <5. From the calculation results, this model has a good explanatory power.

3.Hypothesis Verification of Variables in TLP and TLA on SLA

In order to verify the specific impact of each variable in teaching and learning performance (TLP) and teaching and learning assessment (TLA) on students' learning achievements (SLA), the variables in each dimension in TLP and TLA are used as independent variables and SLA is used as dependent variable to construct two multiple linear regression model tests as shown below:

Table 4 Hypothesis Verification of variables in TLP and TLA on SLA

	M9			M10			Hypothesis	Pass/Fail
	Coefficients	t	VIF	Coefficients	t	VIF		
TLP1	0.071*	1.765	2.525				H9a	pass
TLP2	0.090**	2.188	2.472				H9b	pass
TLP3	0.091*	1.932	3.256				H9c	pass
TLP4	0.175***	4.231	2.641				H9d	pass
TLP5	0.155***	3.501	2.774				H9e	pass
TLP6	0.172***	4.022	2.702				H9f	pass
TLA1				0.107***	3.028	2.350	H10a	pass
TLA2				0.002	0.039	2.952	H10b	Refuse
TLA3				0.055	1.248	3.224	H10c	Refuse
TLA4				0.194***	4.390	3.347	H10d	pass
TLA5				0.048	1.035	3.667	H10e	Refuse
TLA6				0.173***	3.744	3.259	H10f	pass
TLA7				0.313***	7.049	3.122	H10g	pass
R^2	0.602			0.709				
DW	2.200			2.070				
F	102.715			141.523				
Sig .	0.000			0.000				
Total			414.000					

Notes：***、**、*respectively represent 1%、5%、10% significance level.

M9 includes all the variables of TLP, in which model R^2 is 0.602, model fit is very high, significant value is 0.000, D-W value 2.200 is close to 2, and VIF are all less than 5. Therefore, this model has good explanatory power;

M10 includes all the variables of TLA, in which, the model R^2=0.709, the model fit is high, the significant value is 0.000, D-W value is 2.070 close to 2, and the VIF are all less

than 5. Based on the analysis, this model has good explanatory power.

To conclude, the above tables reports the regression coefficient, significance level, and multicollinearity test results. The last two columns report the name of the specific hypothesis and the result of whether the test is passed or rejected. We can see that majorities of variables show positive impact on teaching and learning performances and assessments and in the end all variables of TTA, TL, TT, TM, TLP, TLA have impact on SLA.

Findings in Semi-Constructed Interview

Semi-constructed interview in QNUN harvested large quantity of information on the layer of national policy on AI and wisdom learning, the specific case design and plan of school of AI in QNUN, the opinions and suggestions from the new AI course teachers and the problems in AI connected courses giving.

Interview on top managers of QNUN on progresses achieved are the confirmation of running school of AI from the Ministry of Education in China in 2018. 220 students enrolled and started their courses in autumn in 2019. Problems were revealed in insufficient faculty of "dual qualification" for teaching in School of AI in QNUN, needs for bringing in both intelligent technology and talents, need to explore market for realizing combination of Industry-University-Research.

Teachers reflect that they can offer basic curriculum teaching in computer science, but they meet with new challenges for new knowledge and skills because new educational requirements ask teachers to adapt to new teaching contents and environments. Besides, they are facing new problems and new challenges from online and offline teaching in teaching contents, teaching methods, teaching tasks and interaction types, teaching materials and teaching assessment. Problems were the weakness on online course on lacking supervision system in examination, no guarantee for security problem and patent property protection. And they reflected that there were more challenges in preparing teaching plan in AI related courses because it is more demanding for the professional skills from the teacher in both computer science knowledge and practical skills.

Progress reported from students say that online course are rich in resource, lecture time

saving and flexible arrangement of study time. Besides, virtual teaching environment can solve the problem of not having real native speaker in supporting English teaching and learning. They can have practical software for self learning to develop individualized personalized learning.

Problems reflected from students were mainly on slow internet, cutting off learning process, less interaction and free chance to express instant inspiration like that in class and unfamiliar skills in computer application.

Discussions

Impact of Artificial Intelligence Assisted Approach on English Teaching and Learning to study the impact of artificial intelligence assisted approach on English teaching and learning. Found from the respondents' perspective show that artificial intelligence assisted approaches are functioning as promoter for English teaching and learning and acting as a tester for source of classroom data and assessment in terms of classroom performance corresponds to Nur Fitria, Tira (2021). that says Artificial Intelligence (AI) is a human intelligence simulation based on computers and designed to function as human beings. AI is one of the drivers of the 4.0 industrial revolution to facilitate education in teaching and learning. This research is to know the role of AI in ELT and to investigate AI technologies in ELT. AI-assisted devices are a sub-section of computer-assisted language learning for foreign language learning (CALL). AI provides a wide variety of developments in foreign language education with the exponential development in natural language processing and technologies to cope with big data (Li, 2020). English language teaching (ELT) is considered an integral educational aim in terms of improving the potential of students to interact internationally (Mukhallafi, 2020).The significance of the research is to advocate educational innovation and reform focusing on the development of an educational model of "teaching, learning, examination, evaluation, and management" to promote the integration of technology and educational scenarios and further promote the empowerment of smart education.

Contribution of the Research

This research contributes artificial intelligence assisted approaches in education by the practical application case study in Guizhou, China to prove its reliability, feasibility, effectiveness, operability and generalizability in language teaching and learning.

Based on the above research, the author developed a mind mapping combining artificial intelligence, language teaching and learning and class management as the following steps:
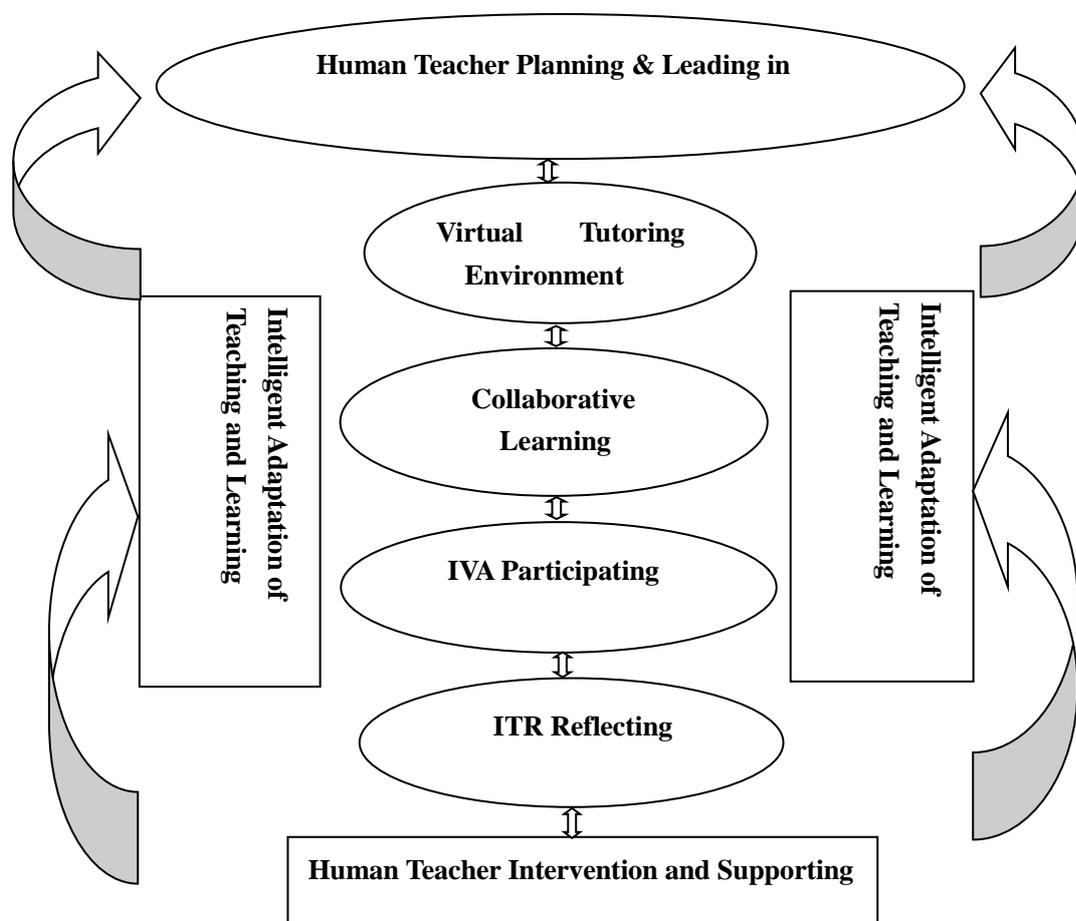

Figure 1 Contribution of AI in ELT

Figure 1 demonstrates the design of combining AIAA in classroom teaching and

learning. Step 1 is human teacher planning and leading in, in which the teacher's role is classroom activity organizer. Step 2 is virtual tutoring environment, in which the settings are served for the learning tasks and activities. The environment can be authentic resembling real situation in real life and can also be replicate environment designed by virtual tutoring programmers. Step 3 is collaborative learning. Collaborative learners can be study group members, and can also be virtual agents in virtual environment. Step 4 is IVA (Intelligent virtual agents) participating. IVA can be expert facilitator, or can be virtual adaptive learning group member. They can lend or sell you experience value to escalate the learner's level in study. Step 5 is ITR (Intelligent tutoring robots) reflecting. ITR can deal with, reflect or response to the learning group's performance in action. Then, they note down in their memory storage chips and make assessment of the level of tasks and activity fulfillment. Step 6 is human teacher intervention and supporting. After received the reflection and assessment results from intelligent virtual robots, human teacher will supervise the learning groups and offer help or support in guiding them to reach the learning goal.

The last step is intelligent adaptation of teaching and learning. After intelligent virtual robots give the analysis results and then will inform human teacher to pay attention to what the problem and difficulties are in their learning process. Then, intelligent virtual adaptation will be renewed for providing on-going intelligent solution and guidance to ensure that the learner engages properly with the intended learning objectives without becoming confused or overwhelmed. After that, a new round of program can start as shown in figure 1

Conclusion

To summarize, the application of AI is not just an assisting approaches in education now, but becoming a main tool in online teaching and offline teaching in view of concepts of new era higher education under the shock of COVID-19 pandemic and new situation of the world development. It is not wise to close the door to build its own "ivory tower", but to open the door to the whole world, link up with enterprises, and establish talent training channels. Making full use of the resources of major national craftsmen and national model enterprises

and entrepreneurs to enter the campus to guide and encourage students. The practice of AI technology assisting education in schools with "regular reporting", "specialized research and development system", "enterprise internship system", and "integration of production and education" will open up new situation and new way for the construction of schools of artificial intelligence in China.

References

Coggine. A. (2018). *Understanding Artificial Intelligence: 3 Key Concepts*, from http://www.CTOVision.com.

Lei. C. (2020). *Riding on the Momentum to Start a New Journey of CERNET Construction.* China Education Online, 12-02-2020.

Li, R. (2020). Using Artificial Intelligence in Learning English as a Foreign Language: An Examination of IELTS LIULISHUO as an Online Platform. *Journal of Higher Education Research*, 1. https://doi.org/10.32629/jher.v1i2.178

Li. C. (2019). A*pplication and Research Hotspot of Artificial Intelligence in Foreign Language Teaching.* China Education Informatization, China.

Metaxiotis, K. S. & Samouilidis, J. E. (2000). Expert Systems in Medicine: Academic Illusion or Real Power. *Information Management & Computer Security*, Vol. 8, pp. 75.

McGuire B. (2006). *The History of Artificial Intelligence*. University of Washington.

Mukhallafi, T. R. A. (2020). Using Artificial Intelligence for Developing English Language Teaching/Learning: An Analytical Study from University Students" Perspective. *International Journal of English Linguistics*, 10(6), 40. https://doi.org/10.5539/ijel.v10n6p40

Nur Fitria, Tira (2021).The Use Technology Based on Artificial Intelligence in English Teaching and Learning, *The Journal of English Language Teaching in Foreign Language Context* (2021), Vol 6(2)DOI: 10.24235/eltecho.v%vi%i.9299

Popenici S. A. D. & Kerr. S.(2017). *Exploring the impact of artificial intelligence on*

teaching and learning in higher education. Research and Practice in Technology

Enhanced Learning.

Ukachoke. C. (2018). *The Basic Theory of the Mind-The Basic Theory of What We Are.*

Charansanitwong Printing Co. Bangkok, Thailand, from https://mindtheory.net/.

Yang, J.& Zhang. B (2019). *Artifificial Intelligence in Intelligent Tutoring Robots:*

A Systematic Review and Design Guidelines. Applied Sciences, Beijing 100071,

China.