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A Study on the Job Replacement Impact of ChatGPT and Education Method

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ABSTRACT

This paper deals with the job impact of ChatGPT and education preparation for that, which will give an influence on many areas because it can be implemented with ease as just normal editing works and speak including code development by using huge data. Currently young generations will take a big impact on their job selection because ChatGPT can do well as much as human can do it everywhere. Therefore, education method and system should be rearranged as new curriculums. However, government and officers do not understand well how serious it is in education. This paper provides education method and curriculum for AI education including ChatGPT through analyzing many papers and reports, and experience.

Keywords: ChatGPT, Generative AI, Education, AI curriculum, Chatbot

INTRODUCTION

Currently, so many are interesting in the ChatGPT on how to use it and application after released ChatGPT in March 2023. How do it and how much is it to use? Some reports (Lund, 2023) mention the value of ChatGPT that its impact is over steam of the 1700s.

Some beginners and experts of IT worry about its impact on all sorts of jobs and creativity that previously thought to be human creativity and reasoning such as writing, drawing, analysis, music, and so on. AI jobs and productivity will be affected.

Many technologies, such as fuzzy (Zadeh, 1965), PSO (James, 2011), Immune (Jerome, 2000) have been leading AI and they have been impacting on economic development and jobs whenever we had an experience for revolutions such as, agriculture, industrial revolution, and information revolution so far. Now, we have 4th industrial revolution. That is, all the amazing advances of AI (Jeon, 2020, Chung-ang Univ., 2022) and combination of D.N.A (Data+Network+Artificial Intelligence) (HODS, 2022) over the last decade has been improving education and economic growth, and changing jobs patterns. Of course, some investors and entrepreneurs have become rich and have been benefiting from these digital revolutions.

From Alpha go event of Google of 2016, many countries and experts have been interesting this AI function and possibilities for economic growth and job replacement. Among them current ChatGPT has top ranking of interesting topics and many company releasing another product (S/W, business, job, analysis, and etc.) based on ChatGPT.

Over the last decades, of course, their wages, productivity growth, and business capabilities have been changing because of their decision and service philosophy by prediction (University of Washington, 2006).

Herein, what will ChatGPT impact on economy and job in the future?

After opening ChatGPT from and Dec. 2022 (Chat3.5) and Mach 2023 (Chat4.0), several issues and worrying about education, and social situation are increasing. Here, we must have an idea: how scientists and engineers will create the positive application of ChatGPT? Using this technology, some advanced country and rich person can have much chance to advance and property but underdeveloped country and poor person will not have a chance to survive. That is, AI inequality issues and problems will increase.

Basically, ChatGPT has an ability with human-like writing and additionally Google released Bard trained DALL-E2 model, which can generate images on demand by huge

amounts of data. MS also OpenAI developed another model LaMDA (it has two stages for trains like pre-training and fine-tuning with 1.56 trillion word, 137 billion parameters) for their completion against Google model (https://www.searchenginejournal.com/how-google-lamda-works/442064/#close).

MS announced Bing AI powered OpenAI GPT-4 and they can use it on real time service. Also, many ventures and companies are trying to build new business by using these Chatbot technologies. That is, economic growth paradigms are changing because of this powerful ChatGPT of OpenAI and related Chatbot. The ChatGPT (Kalla & Smith, 2023) is a big power engine for economic growth and job changing.

The first aim of the paper is to provide how ChatGPT and related technology is impacting on job through analyzing and reviewing report and papers. The second purpose is to design how we should educate for AI including ChatGPT. Especially, this paper focuses on how we have to introduce into your education system for the young generation's job. It is very important to understand and decide on how and what we have to teach and learn because of current confusion paradigm of AI.

LITERATURE AND ANALYSIS OF CURRENT CHATGPT

There are several ChatGPT and related generative AI after releasing GhatGPT 3.5 and 4.0 for ChatGPT based technology. That is, many ChatGPT-based applications are developing it is changing for our economic growing pattern and job changing. In this section, this paper provides current patterns for ChatGPT technologies and its application.

ChatGPT of OpenAI

This AI technology has a very strong trigger role to develop new AI and has initiative in AI areas (Kalla & Smith, 2023; Frady, May 2023). Figure 1 shows the timeline of ChatGPT development. We can see on how competition is struggle from this figure. It means the event of ChatGPT is quite big impact on economic area and job changing.

OpenAI do open their parameter to train, but they guess that ChatGPT-3 175 billion parameters. About parameter, they describe like: GPT-1, 117 million parameters; GPT-2, 1.5 billion parameters; GPT-3, 175 billion parameters billion parameters (it is about 100 times larger than GPT-2). And ChatGPT has 170 trillion parameters (Johnson, March 2023).

In case of ChatGPT-4 (Bhatia, March 2023), it has different parameter such as, positional parameter (it is function is to understand the order of words in sentence), learned parameter (which is making an accuracy of learning through weights and bias tuning), hyperparameters (definition of the overall model structure and model behavior), and model configuration parameters (definition of the number of layer and nodes in each layer).

The number of parameters in a language learning model means a measure of model capacity for learning and complex understanding. That is, a language model with more parameters can learn more detailed and nuanced illustrates of language. So, it allows model to generate more accurate and human-like sentence. However, it needs a vast amount of computing power and energy, and it can be overfitting (it starts to learn noise in the training data instead of the underlying patterns).

The ChatGPT (Ray, March 2023) has a very strong trigger for AI revolution in real for everywhere and for many. It is clear evidence that the AI revolution has real potential.

OpenAI ChatGPT timeline (1) https://www.searchenginejournal.com/history-of-chatgpt-timeline/488370/

3years
5-Months

Date	Milestone
16/June/2016	Published generative model for image, sentence, sound and to generate similar data
11/Jun/2018	**GPT-1 announced on the OpenAI blog.**
14/Feb/2019	GPT-2 announced on the OpenAI blog.
28/May/2020	Initial GPT-3 preprint paper published to arXiv.
11/Jun/2020	GPT-3 API private beta.
22/Sep/2020	GPT-3 licensed to Microsoft.
18/Nov/2021	GPT-3 API opened to the public.
27/Jan/2022	InstructGPT released as text-davinci-002, now known as GPT-3.5. InstructGPT preprint paper Mar/2022.
28/Jul/2022	Exploring data-optimal models with FIM, paper on arXiv.
1/Sep/2022	GPT-3 model pricing cut by 66% for davinci model.
21/Sep/2022	Whisper (speech recognition) announced on the OpenAI blog.
28/Nov/2022	GPT-3.5 expanded to text-davinci-003, announced via email: 1. Higher quality writing. 2. Handles more complex instructions. 3. Better at longer form content generation.
30/Nov/2022	**ChatGPT announced on the OpenAI blog.**

Figure 1 (a): ChatGPT history

OpenAI ChatGPT timeline (2)

Date	Description
1/Feb/2023	ChatGPT hits 100 million monthly active unique users (via UBS report)
07/Feb/2023	MS announced ChatGPT-powered Bing.
22/Feb/2023	MS released AI-powered Bing Chat on mobile
01/March/2023	OpenAI ChatGPT API for developer
14/March/2023	OpenAI released GPT-4 ChatGPT and Bing for reliability, creativity, and problem-solving functions.
14/March/2023	Anthropic launched Claude, which is an alternative ChatGPT.
21/March/2023	Google launched Bard, it ia an alternative ChatGPT.
23/March/2023	OpenAI began rolling ChatGPT plugin support, browsing, and code interpreter.
31/March/2023	Italy banned ChatGPT for collection personal data and lacking age verification
23/April/2023	**OpenAI released CharGPT plugins, and GPT-4 with browsing in ALPHA.**
25/April/2023	OpenAI added ChatGPT data controls to choose conversation and training data for the future GPT models.
28/April/2023	The Italian Garante released 0n demean Italian resume service.
15/May/2023	OpenAI launched the ChatGPT iOS app.
16/May/2023	OpneAI CEO Sam Altman will innovation.
23/May/2023	MS announced Bing would power ChatGPT web browsing.
24/May/2023	CharGPT survey center announced 59% of American adult know ChatGPT and 14% tried it.
25/May/2023	OpenAI launched a program to award ten100,000$grants to forvresearcher to develop a democratic system.
31/May/2023	ChatGPT Plus users access over 200ChatGPT plugins.
31/March/2023	Generative AI will key for economic growth (Goldman Sach), analysist.

Figure 1 (b): ChatGPT related time line

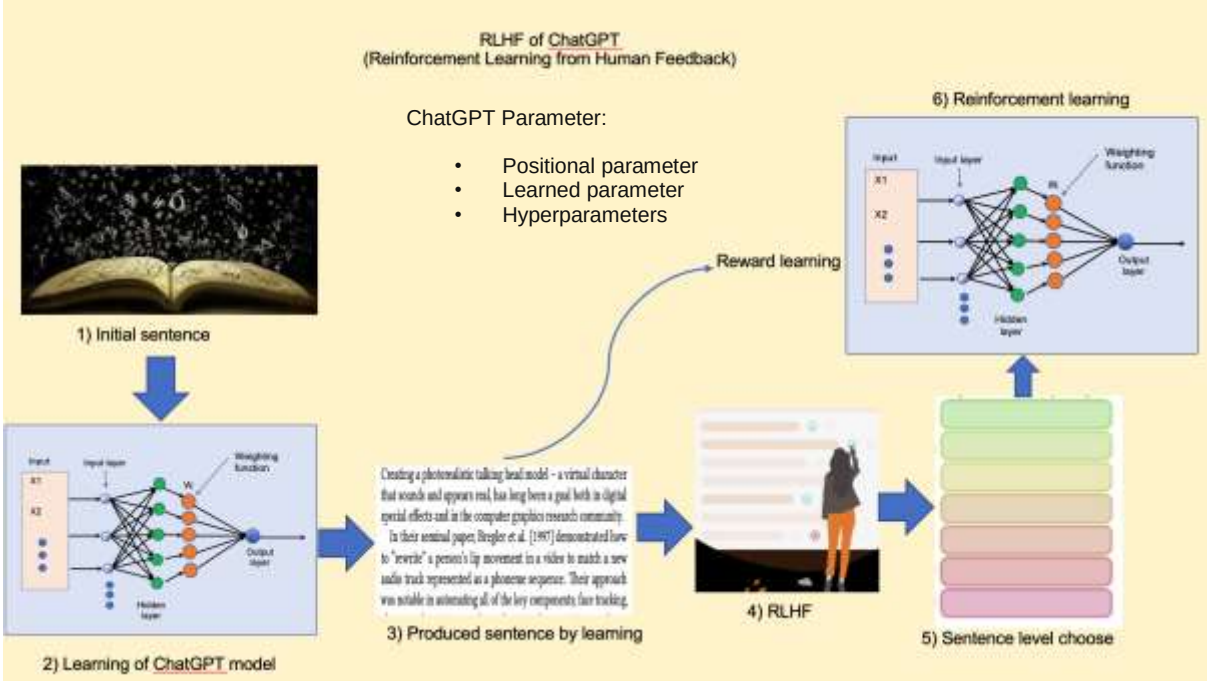


Figure 2: Learning process of ChatGPT for sentence

MS decided to invest $ 10 billion in OpenAI to develop ChatGPT and introduce a new technology into their Bing search engine. MS also said that they invest a $250 million fund to develop generative AI for startups in March 2023.

There are some reports (MIT review, 2021) that generative AI will change such as jobs (especially, a leading expert on the impact of technology) and GAI (Generative AI) will give a big influence on education and expertise. Basically, the ChatGPT will change many things such as word conversion, image transfer (image to text or vice versa), storytelling, image combining (protection against fraud or fake), and others. Therefore, there is able to happen large-scale unemployment.

About this, they can say that replacement of job will be some social issues or problems unemployment. Despite this worry about GAI, AI developers will continue to provide human-like capability AI by their creation. And the other hand, using these related technologies, they can improve the productivity of their workforce, and many reports predict that GAI will extend trillions of dollars in economic growth. Because a majority of the economy is developed and boosted by knowledge and its related combination in the 4th wave.

Technologies depend on how to use this technology to transform businesses and make life as we did in the earlier revolution. It is, so far, just a little bit better to do the task because of the young age of AI. However, it will increase efficiency and productivity. It also will allow us to create new ideas and processes to develop for customers.

Control Issues of this Technology

Who will charge of this amazing technology in the future? In the future, AI models will make researchers drive technology development. The capabilities and potential of large language models are already proven through research and scientific theory. Additionally, it turned out that after being fine-tuned by several times and days with many relevant examples and models as well as advanced machine learning methods.

The biggest impact of GAI is to help human make discoveries human was not able to make our own. It can help expand the expertise and capabilities of non-experts through data and learning models. Therefore, there are many potential impacts of GAI on the economy and

jobs become more imminent and it depends on who will recognize the vision for how much this technology uses it in positive ways.

Some worry about this technology can be remained that the creator of GAI is able to go in the wrong direction because it is the business models. The users and business person can decide to use ChatGPT to replace workers more abilities or to reduce jobs and cost reduction. The problems are that how we choose to use ChatGPT and GAI models.

Microsoft 365 Copilot and Bing

Basically, ChatGPT is a natural language model to learn by using machine learning, deep learning, natural language understanding, and natural language generation to answer or conversation. It is designed to human conversation by understanding your question or question.

This technology can do well cover letters and resume, creating list, describe arts, write code, summarize content, song lyrics, and similar contents using stored data. However, ChatGPT cannot have the capability to search the internet and the most updated information.

As MS 365 Copilot provides AI-powered personalized assistance for tasks and activities, it does not just connect ChatGPT and combines the large language models (LLM) with user data in the MS graph such as calendar, email, chats, documents, meeting records, and others.

MS released ChatBing Feb. 2023 and it likes OpenAI in the search engine Bing. MS is extending to Chrome and Safari unlike they used only Edge of the browser of MS. MA also unveiled a tool called TypeChat to connect the gap between apps and natural language communication on GitHub on July 24, 2023 (https://www.onmsft.com/news/microsoft-introduces-typechat-empowering-apps-to-communicate-in-natural-language-with-users/).
They have an intension to build super-smart AI that can understand human language through a special library of TypeChat that helps apps use language better. MS is studying robot control using ChatGPT as shown in Figure 3.

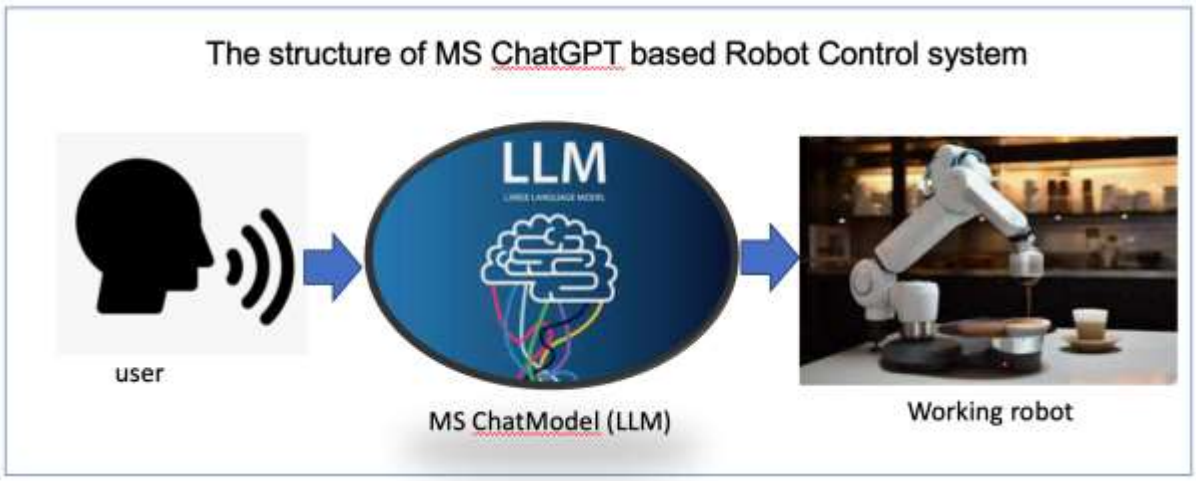
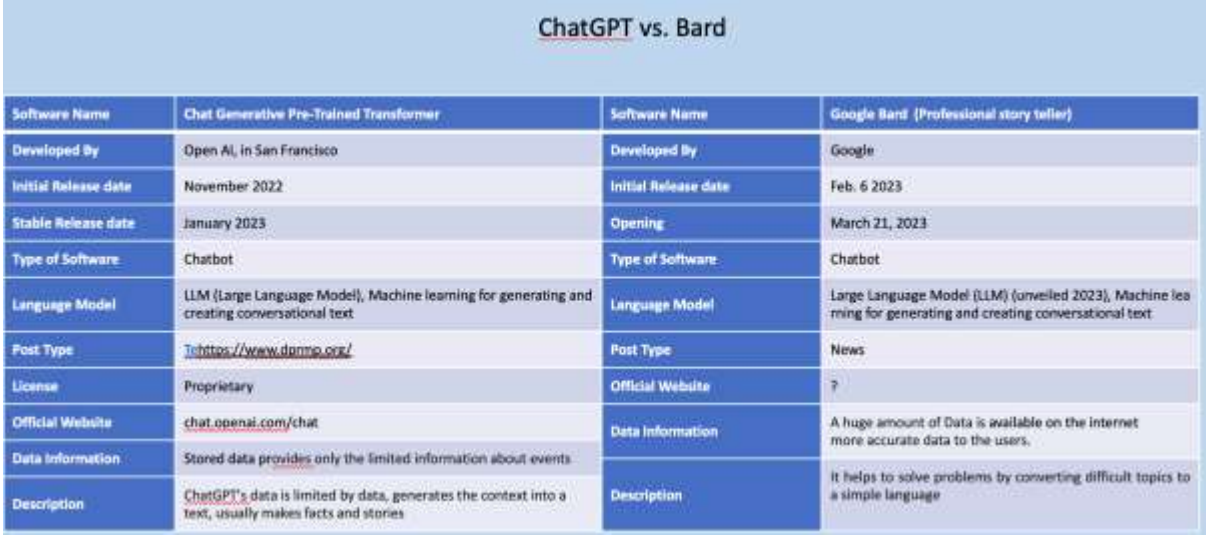


Figure 3: Control structure of MS based on ChatGPT

Google Bard

Google Bard the chatbot, which was released under AI just like ChatGPT on March 21, 2023 for conversation with human. ChatGPT can be used only on the web browsers but Google bard can help in doing tasks like planning a vacation, meal planning, finding some reservation, and etc.



ChatGPT vs. Bard

Software Name	Chat Generative Pre-Trained Transformer	Software Name	Google Bard (Professional story teller)
Developed By	Open AI, in San Francisco	Developed By	Google
Initial Release date	November 2022	Initial Release date	Feb. 6 2023
Stable Release date	January 2023	Opening	March 21, 2023
Type of Software	Chatbot	Type of Software	Chatbot
Language Model	LLM (Large Language Model), Machine learning for generating and creating conversational text	Language Model	Large Language Model (LLM) (unveiled 2023), Machine lea rning for generating and creating conversational text
Post Type	Tohttps://www.dpmp.org/	Post Type	News
License	Proprietary	Official Website	?
Official Website	chat.openai.com/chat	Data Information	A huge amount of Data is available on the internet more accurate data to the users.
Data Information	Stored data provides only the limited information about events	Description	It helps to solve problems by converting difficult topics to a simple language
Description	ChatGPT's data is limited by data, generates the context into a text, usually makes facts and stories		

Figure 4: Comparison on ChatGPT

Meta

Meta opened its LLaMa2 as open source, which was pre-trained using 7 trillion, 130 trillion, 70 trillion parameters on July 18, 2023. They announced that FAIR (The Fundamental AI Research) of Meta also is studying through cooperation with Boston Dynamics on July 26, 2023 (http://m.irobotnews.com). LLAMA Model (Version 1) was developed from Dec 2022 to Feb. 2023, which is an auto-regressive language model based on the transformer and it can be trained easier because it is a smaller parameter than another model.

MS vs. Google vs. Meta

Item	Microsoft	Google	Meta	Remark
Model name	Prometheus	LAMDA	LLaMA	
Open date	Feb 2023	May 2021	Feb 2023	
The number of Parameter	175 trillion	137 trillion	7 trillion 13 trillion 33 trillion 65 trillion	Meta: Source open Others: Not open
Service	Bing search Azure web	Bard (Google search)	Source open	
Description		mage (Muse) Music (AI MusicLM) Video (AI Imagen video)	Research 20 Language learning Service for content	

Figure 5: Comparison MS, Google, and Meta of ChatGPT

Other Chat Platform

There are other Chatbot platform after releasing ChatGPT as we can see from Figure 1(b). It means its impact so big on the social, business, and job impact. For example, Google search with a text generator was opened by ChatSonic and AI. They also opened test version of WriteSonic as free of charge, which lets users discuss topics in real time to create text or images.

Jasper Chat platform enables content creators to specify keywords and tone of voice in users' prompt. Therefore, Jasper chat was focused on specially company's brand-relevant-brand content and conversations with customers.

YouChat is the AI chatbot of Germany engine for fact-check and source review. NeevaAI is Germany search engine, which provides answer to quotes from original sources. Figure 6 shows the prediction of ChatGPT based App, which will be developed in the future for their purpose quickly.

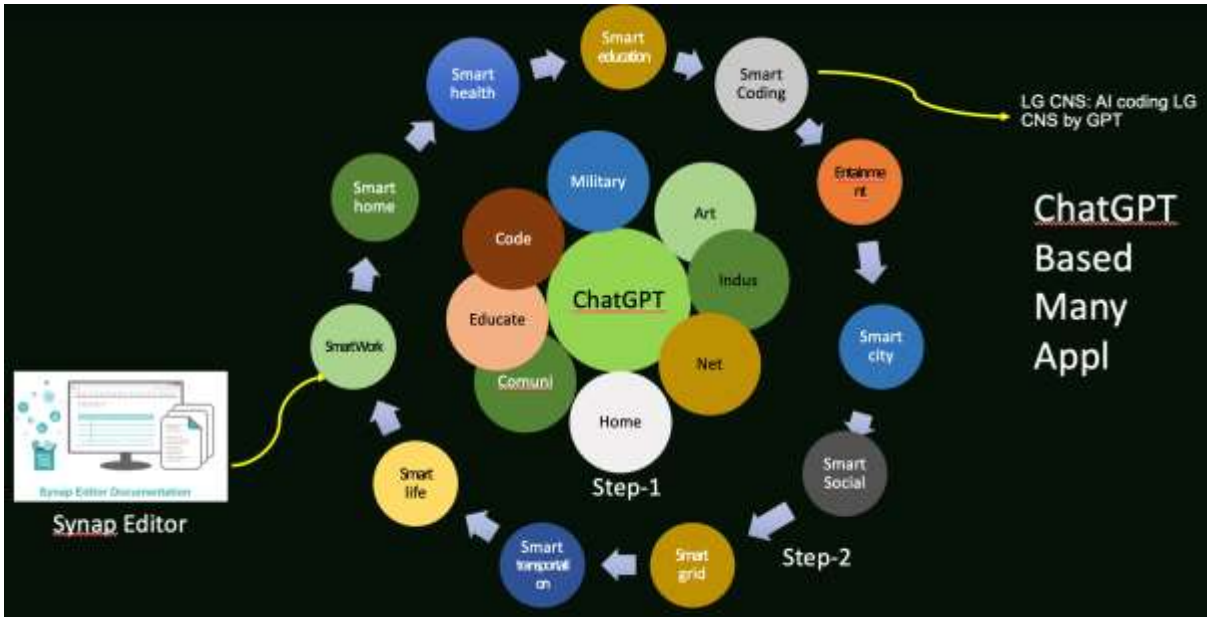


Figure 6: Comparison MS, Google, and Meta of ChatGPT

JOB IMPACT OF CHATGPT

As described in the previous section, ChatGPT will give an impact on many areas and jobs and replace their job patterns. Therefore, we must prepare and education will also be impacted from these related technology.

Education and Teaching Job

The number of teachers will be reduced because it is possible without human interaction between the teachers and students. Additionally, teacher should understand the emotional, psychological, cognitive growth of the students while teaching sensitive topics like equality, discrimination, fundamental rights, and etc. ChatGPT will charge many logical answers to regular topic.

The teacher has to innovate their way of conducting classroom teaching, without being inside classroom. During past C-19, many found it difficult to conduct online classes. However, teaching pattern is going on to remote conducting classroom.

Basically, teachers must use ChatGPT in creating lesson plan and ChatGPT will help all teacher's conductor or professional areas. However, legal sector will not allow it easily for introducing.

Every student can learn his own way using ChatGPT (or other AI tools). Educator also can use ChatGPT to customize teaching matching the skill and personality of each student.

• *Teaching skill reducing:* It will be very positive because not all teachers are trained equally to have an experience in education. Many young educators need time and experience to understand how they should teach and strategy. ChatGPT will make closer gaps these skills by offering personalized content for each student.

• *Customized teaching for students*: It will do well with ChatGPT and assistance. In the past during C-19, online learning methods has been increased. However, it makes teaching method difficult for teachers to evaluate all of them because many students have to join online courses through platforms. In the future, with the help of ChatGPT, the task will become easier because ChatGPT can also provide analytics on how each student is progressing with the course.

• *Teaching overdue reducing:* Teacher spend many hours to prepare lesson plan, assignment question, assessments, exercise, and reviewing for homework. With helping by ChatGPT, teacher can generate lesson plan for week or months in advance for different courses for teaching. They can also create assessments in various formats, such as essay, fill-up, MCQ (Multiple Choice Question), and description patterns for examination. Of course, teachers can generate various document resources and different teaching content.

• *Syllabus designing*: All educators have to spend to design syllabus and update in every semester. Creating the new syllabus in every term is tedious activity to change and modify. ChatGPT will help in designing syllabus outline for the desired teaching outcomes.

Smart teaching method: ChatGPT can check grammar and spelling in assignment for educator.

Basically, ChatGPT can be helper for their workload and enhance critical skills through this technology.

Developer and Technology Areas

The S/W developer and high-tech developer area will paradoxically be one of the most risk or challenging job because of ChatGPt's good information and guidance for developing.

You have to continuously work and update on your skill. Without doing that, you will not be proficient and will not take some advantages for your works because ChatGPT will do general work and guidance.

ChatGPT will collect data easily for market and researchers have to use your knowledge to analyze market for customer.

Social media developer and analyzer for market have to understand various aspects such as the emotional makeup of users, political preferences, cultural choices, religious convenience, education level, local (region), and etc. The ChatGPT (AI)-generated content will not be allowed in officially organizers and these trends and factors stimulate a good social media strategy for audience. Therefore, there will be risk and challenging such as low wages job, job with lack of expertise and specialization for higher-level task, job with lack of critical thinking, job with lack creativity, job with lack of analytical skills, repeatable job, and traditional method using simple skill.

Creator and Designer

The creator and designer such as interior designer and outdoor designer, picture drawer, novel creator, and story teller will be impact from ChatGPT for their overview design and work patterns because ChatGPT will make well overview conception and detailed thing. Especially, ChatGPT can use huge data and will make immediately easier than human.

EDUCATION METHOD

Many countries such as S. Korea, Canada, USA, Finland, China, and others are introducing AI education into their education to have an initiative AI. S. Korean government also recognizes the importance of AI education. Therefore, they announce that primary school introduces at Sept 2020 for grade 1, 2 of primary school (European schoolnet, 2021; Thomas et al., 2022; Barbour, 2023). The vice ministry of education of S. Korean government announced that they offer an AI education program for primary schools from Sept. 2020 after

testing in March 2019.

They also provided an AI education program for high school from Sept. 2021. Local education office planned AI education program linked with S/W education for Primary school and middle school.

They plan that they will provide the advanced AI curriculum for K-12 AI education till 2025. Table 5 AI education curriculum of primary school. For these educations, government announced that the plans the nurture program of AI teachers' master course for school on Nov. 7, 2019 (Ministry, 2019). Therefore, teacher's master degree for AI education will be finished the end of 2022. It means there is no experience in education and AI curriculum design (EduPress, 2019; Yeonju et al., 2022)

This paper aims to provide a good AI education method with ChatGPT through AI education and site experiences. It is a quite experience to nurture manpower for introducing ChatGPT. Especially, the curriculum design for AI education needs AI education experience for a good teaching as knowledge area curriculum. However, still a very few people in K-12 have experience not including ChatGPT.

Herein we have to provide an AI education curriculum including ChatGPT. The UNESCO has the three core contents for AI education (UNICEF, 2021):

- AI algorithm and programming with data, data collection, labeling, and analysis, and business and social related AI for K-12 AI education;
- Understanding the ethical challenges of AI for Personal & citizen, social impacts of AI for workspace, AI application outside of computer science for frameworks;
- Theoretical understanding of AI, Human-facing applications, the creation of new AI. However, there is no mention about ChatGPT because that is a new area.

Figure 7: Education philosophy

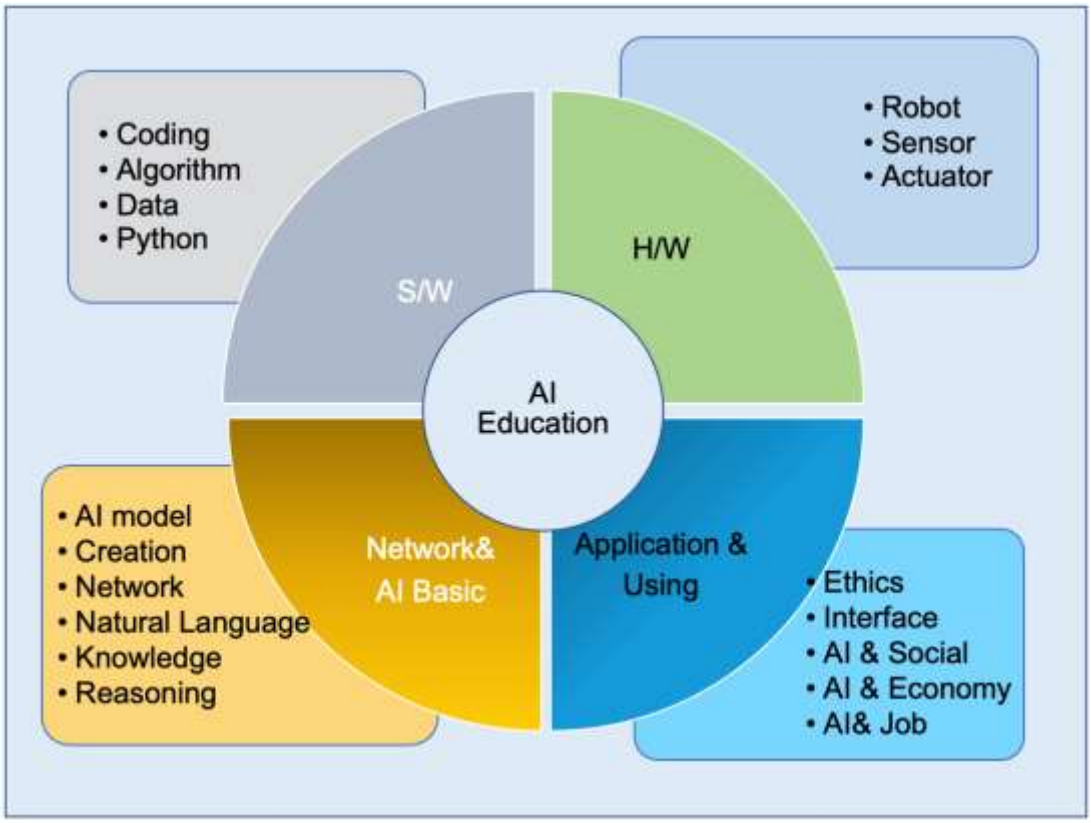


Figure 8: AI basic education contents suggested in this paper

S. Korea start K-12 AI education program from Nov. 2019 and officially, there were no AI teacher in the K-12 education site. They started AI teacher's master program from 2020. It means that there is no expert in the K-12 education site. However, there is no mention about ChatGPT yet because of too early. For recovering this issue, this paper describes on how ChatGPT is important and will impact on education for AI education.

Basically, AI education is one of program of the education. So, it has the basic national philosophy and school's purpose. Figure 6 shows the basic education purpose for these targets. For this purpose, teachers must develop their teaching style through seminar, workshop, inviting, and etc.

Figure 8 shows the basic idea of this paper for AI education curriculum. This basic idea of this paper uses Ministry of education by written for this purpose. AI is one of the technologies. To use it effectively well, we must understand related technologies and literature. Figure 8 is for the designed AI curriculum for K-12 including kindergarten.

Table 1: Suggested AI curriculum for K-12

Category	Education area	Curriculum contents
AI foundations	Algorithms and Programming	AI algorithms (machine learning model, training a classifier, Machine learning in general, supervised and unsupervised learning, reinforcement learning, deep learning, and neural networks), AI programming (Loop, Condition, Statement, Modeling, Debugging), Machining/Deep learning, Pyhton, Pytorch, AI Model, Speech recognition, Image classification, Text recognition, Multi-recognition
AI	Data literacy	AI applications run on big data. Managing the data cycle from

foundations		collection to cleaning, labeling, Developing/using for AI. Understanding of data and its functions, Data ethics, Data for AI and society, Data and Machine Learning.
AI foundations	Contextual problem-solving	AI for solution to business-related or society,
AI foundations	Knowledge & Computational thinking	AI based thinking, Thinking based AI, Knowledge development for new AI, Inferences and AI, Natural and AI, Smart life, AI and human being mind
Country Philosophy & Ethics	The ethics of AI	Philosophy and Korean culture, AI ethics, AI law & Safety, AI and society, ChatGPT and AI, Global society and AI trend
Social & Job	Economy & Job	Technology and economic development, Digital technology & Impact, Technology and Smart life, AI technology and economy, AI and new job/disappearing job, ChatGPT, Preparing area/Job, Job changing
Social & Job	The social impact of AI	AI and social impact, Job transforming & pattern
Developing & Using AI	Using AI techniques	AI and computer science, AI and industry, AI and data, AI and music, AI and art (Music, Figure, Design, Novel, Story-telling), ChatGPT
Developing & Using AI	Developing AI technologies	Knowledge for the creation of new AI applications AI Knowledge and service for a social challenge or provide (coding, mathematics, data science, program design, visual design, universal design, user design)

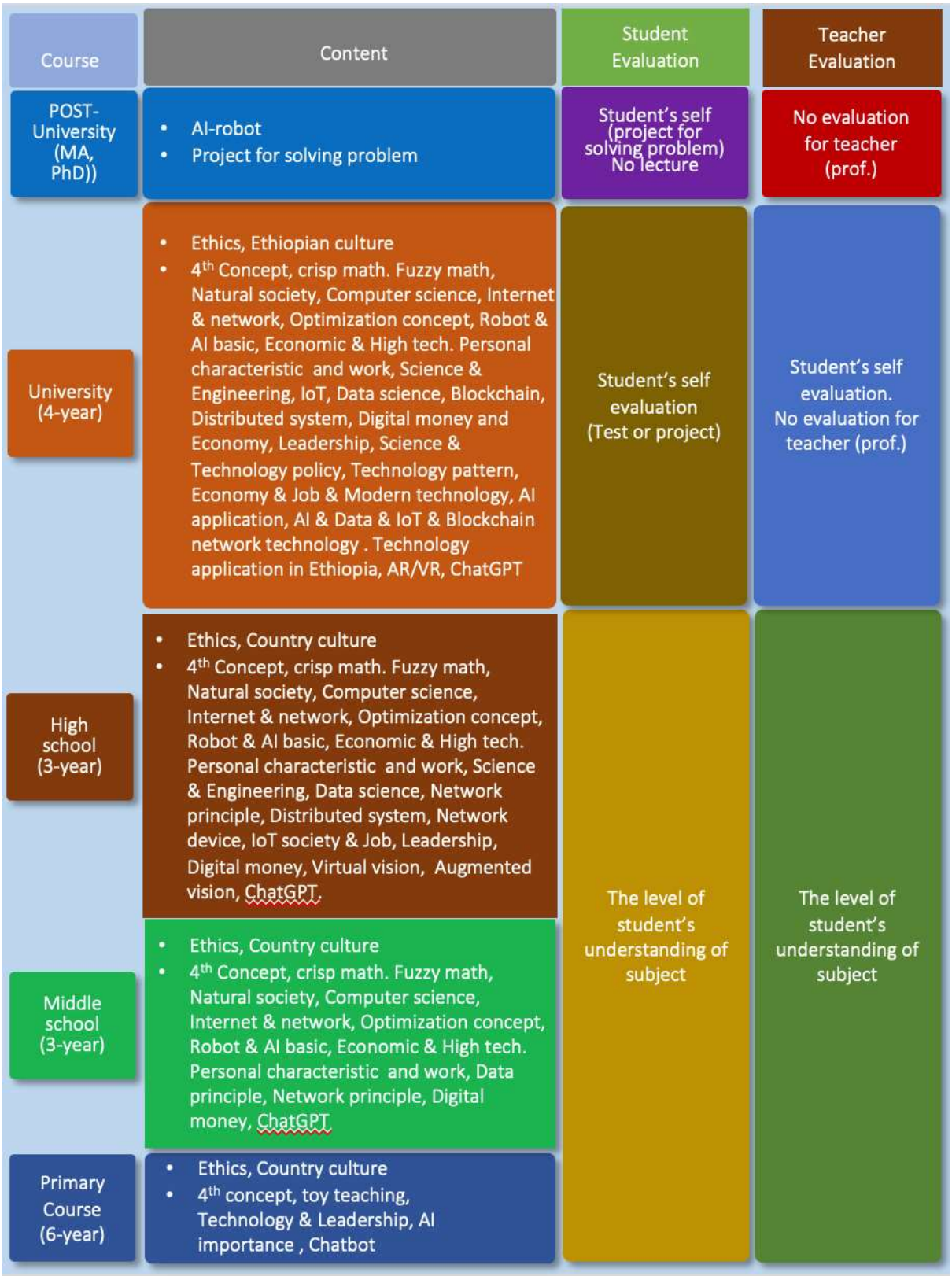


Figure 9: AI curriculum for AI education

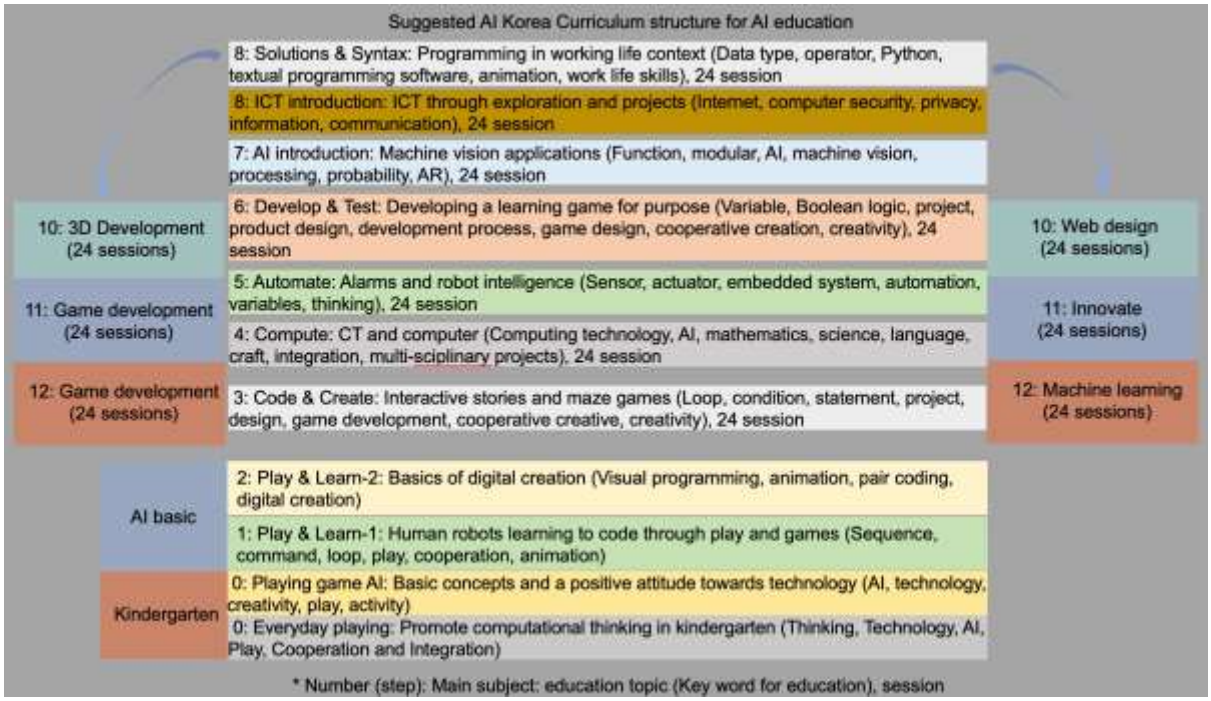


Figure 10: Designed AI curriculum for AI education

CONCLUSION

This paper provides materials and methods for how lecturers can teach well students and beginners through the author's teaching experience (Dong Hwa Kim, 2020; Dong Hwa Kim, 2022), during AI and ChatGPT revolution.

The OpenAI released ChatGPT3.5 on Dec. 2021 and they opened ChatGpt4.0 on March 2023. Its impact is serious in education systems like K-12. It means that the education system should prepare for AI's impact on traditional education.

Table 1 and Figure 7-10 show the designed Korean AI education curriculum. Of course, for this design, this paper analyzed the previous material. Many references provide educational material for machine learning and deep learning by using simple tools on online.

The left column of Figure 10 means the education level of AI. An AI will have an impact on student and their job. Therefore, the curriculum should prepare for their like Figure 7-10 for their purpose. Of course, they can modify these materials for their aims.

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