Laying the Foundation for Enjoyable Learning*

Keiwa College Academic Welcome Lecture for New Students

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Abstract

Looking back over the past 100 years, we have witnessed remarkable advancements in solving mathematical and scientific problems, which have led to significant technological progress and the rapid development of artificial intelligence. On the other hand, the world continues to face serious challenges such as the widening gap between rich and poor, ongoing conflicts in various regions, global pandemics, and climate change. As these issues deepen divisions in human society, we are now confronted with a crucial question: Amidst such rapid change, what should we value, how should we learn, and how should we live? I would like to explore these questions together with you.

Speaker: Hiroshi Suzuki (Professor Emeritus, International Christian University)

At the university, he taught mathematics and data science, and was responsible for programs such as service learning. He also held weekly Bible study meetings at his on-campus residence. He retired in March 2019 at the age of 65, and is currently continuing his studies while volunteering at a children's home and other organizations.

(Homepage: https://icu-hsuzuki.github.io/science/index-j.html)

*Translated with the assistance of ChatGPT

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1 Introduction

1.1 Self-Introduction

[no.3]

Congratulations on your admission!

As introduced earlier, I am currently serving as a board member at a children's home, where I support the children's learning and volunteer for overnight duties. The facility accommodates children ranging from three to eighteen years old, and all of them love playing games. The girls are also very good at dancing. To my surprise, perhaps due to the influence of K-Pop and other factors, there are several elementary school students who can read Hangul[1] . Since I use a language-learning app called Duolingo, I decided to test their skills, and indeed, they can read quite well. Sometimes the lyrics are displayed in Korean on the screen, and it seems they learn by watching and memorizing them. Do you also enjoy dancing or playing games?

Reflecting on my own childhood, I remember that during my elementary and middle school years, I played the game of Go. Although I played with friends as well, I particularly recall visiting my grandparents' home during summer and winter vacations, where, even when the rest of the family went sightseeing or shopping, I would spend all day playing Go with my grandfather from morning until night.

2 Walking Together in Life

2.1 High School Days

[no.4]

In the fall of my first year of high school, [2] a student riot erupted. Some students, along with students from other schools, barricaded the area around the principal's office. Daily discussions about political issues ensued, and the riot police intervened. For several months, there were no classes. As divisions grew among the students, I started attending church. Most members were university students, and listening to them and joining their activities made me feel like I was stretching beyond my years. It was a time when my world suddenly expanded.

The pastor of that church [3] had served as a missionary in Southeast Asia during the war. After the war, as part of a "work of atonement," [4] he established a dormitory for Southeast Asian students, inviting war orphans and children born between Japanese soldiers and local women to study or receive vocational training in Japan. [5]

He often said:

> "I want Japanese youth, rather than burning out their energy in confusion, to directly see Southeast Asia and have opportunities to interact with Asian

[1] The script used to write Korean.

[2] October 13, 1969 (Monday)

[3] Rev. Ryoichi Kato of Tokyo Ikebukuro Church, United Church of Christ in Japan. His wife, Asako, was a relative of my father, and both my parents attended that church.

[4] Reference: "Now is the Time for Atonement *Ima wa Tsugunaino Toki*" [3]

[5] He also worked on difficult issues like helping children find their fathers and acquiring nationality for many stateless children.

people for the sake of the next generation."

Influenced by these words, I decided to travel to Southeast Asia with other young members of the church. A shipping company, [6] which the pastor knew personally, organized a tour where young people could travel on a cargo ship, staying in unused cabins at youth hostel rates. Six university students and I—seven people in total—joined this tour.

For nearly a year leading up to the trip, I worked various part-time jobs—washing dishes, helping at inns, assembling machine parts for small businesses, and selling typewriters—to save money. [7] Looking back, while some part-time jobs were tough, they taught me a lot.

2.2 53-Day Cargo Ship Journey to Southeast Asia

[no.5]

In the summer of my second year of high school (1970), I set off on a cargo ship journey.

> The slide photo shows our departure at Honmoku Pier in Yokohama, surrounded by people seeing us off: the pastor's wife, his two daughters, the housemother's grandson, and a trainee from Singapore. [8]

[no.6]

The ship carried used bulldozers and machine tools from Japan to Singapore and Penang, Malaysia (both free trade ports), and then called at Balikpapan and Samarinda on Borneo Island, Indonesia [9] to load raw timber called *lauan* before heading to Busan, South Korea, to unload. It was a 53-day voyage. [10]

Before and during the trip, we held study groups on the Bible, English, and Asian history. We learned about how Japan, under the pretext of liberating Asia from Western colonialism, exploited labor and resources and committed atrocities during the war. I increasingly felt the heavy weight of Japan's wartime responsibility and honestly struggled with how I should face the people of Asia. [11]

[no.7]

At each port, we visited churches and met many different people. Many older indi-

[6] Koyama Shipping: a company that grew during the 1960s focusing on Southeast Asia routes, but went bankrupt on August 21, 1975.

[7] The fare paid to the shipping company was 72,000 yen. At that time, a typical starting salary was about 35,000 yen. Part-time jobs paid between 100 and 180 yen per hour. The church also helped by offering me typewriting work and fundraising through bazaars. Though my parents were worried, they eventually supported me. My father, a government worker in the Ministry of Labor, had a mild disability and, instead of serving as a soldier, worked as a civilian in Indonesia during the war. He had met the pastor there too. Because of his wartime experiences, he said he himself could not go back to Southeast Asia.

[8] A survivor of the Singapore Massacre.

[9] Now called Kalimantan Island in Indonesia.

[10] The ship departed from Honmoku Pier in Yokohama, briefly stopped at Kobe's Sannomiya Port (where we visited Expo '70), then at Hiroshima's Ujina Port (to visit the Peace Memorial Park) before heading to Singapore. In Singapore, we were assisted by a Christian organization related to our church. In Penang, a former dormitory student helped us. In Balikpapan and Samarinda, we had no acquaintances and searched for churches. The decision to unload in Busan came after leaving Samarinda.

[11] Although I had more knowledge than the average Japanese at the time, thanks to the pastor, information about Japan's war crimes in Asia was still limited and often vague.

viduals harbored deep resentment towards Japan and viewed Japan's economic rise with jealousy. [12]

We encountered children desperately trying to earn money in any way possible, [13] and young women who had no choice but to offer sexual services to survive. [14] Seeing how hard they fought to survive, I realized that instead of simply apologizing to each person for Japan's past, what mattered was living responsibly "as someone sharing this moment in time with them." It may not be a perfect way to express it, but I made a silent decision: "Even if we live in different worlds, I will remember these people and live my life in a way I wouldn't be ashamed of before them." [15]

The voyage also left many memories. When several members got seasick and study groups became impossible, I stayed healthy and spent time playing mahjong with the others—becoming fairly good at it. We were allowed into the bridge and engine room, learning about navigation. Passing near U.S. Seventh Fleet warships during the Vietnam War was tense. The night sky was so packed with stars that I couldn't find the Milky Way, and I saw an artificial satellite for the first time. Dolphins often chased our ship, and flying fish sometimes landed on deck—we grilled and ate them! When timber delivery was delayed, sailors lowered the lifeboats so we could row to local fishermen to buy fish. We experienced a massive typhoon that tossed our ship like a leaf. In Korea, under martial law and amid a cholera outbreak, we were quarantined at Shimonoseki. The voyage schedule wasn't fixed; we learned via telegrams [16] that our unloading port had been changed to Busan only much later. We finally returned to Yokohama and home more than two weeks after the second school term had already started. [17] [no.6b]

2.3 Mathematics or Social Welfare [no.8]

Because I had been working part-time so much, my academic performance hit rock bottom. After the trip, I tried harder, but my grades still weren't great. Even so, I loved subjects like physics and chemistry and initially thought about contributing to Asia through those fields. However, I am colorblind, and at that time, many science programs in Japan didn't accept colorblind students. So I chose mathematics, a field unaffected by color vision.

The university I entered had a rare curriculum, even for math departments at the time, requiring computer science and computational theory, so I also studied programming.

[12] While this was somewhat true in Southeast Asia, it was especially pronounced in Korea at that time.

[13] In Samarinda, a boy helping his father with ship work asked for my sandals. He pointed out I had other shoes, while he was barefoot. When I offered him my sandals, he noticed they were slightly torn and refused, saying they couldn't be sold.

[14] Since berthing fees were high, the ship mostly stayed anchored offshore, and we used barges to land. At night, vendors and sometimes call girls or their handlers would approach the ship, offering "massage" services, which were often euphemisms. Some were shockingly young. I was too inexperienced even to understand who they were until explained afterward.

[15] The limited ability to communicate directly, due to language barriers, probably contributed to this way of thinking. Although some Southeast Asian dormitory students were around, I was too immature then to engage more deeply.

[16] Since telegrams charged by the character, messages were extremely short, like us sending "HEIKI" ("Safe") and the church replying "HEIKINARAHEIKI" ("If safe, all good").

[17] We were stranded near the Kanmon Straits for three days. University students were especially worried about missing their final exams needed for graduation.

As I delved deeper into mathematics and started to genuinely enjoy it, someone from the church—who was the director of a children's welfare institution—invited me to work in social welfare. I wavered. Should I continue studying mathematics, something I loved and was fairly good at? Or should I dedicate myself to "living together with others" in a place like a children's home, despite differences in backgrounds?

After much advice and soul-searching, I chose to continue my studies and entered graduate school.

2.4 Walking Together in Life Afterward

[no.9]

After that, life took many turns. During my graduate studies, I studied abroad in the United States for about three years. Later, I got a job at a local national university in Japan, immersing myself in mathematics research. Then, I transferred to International Christian University (ICU), a liberal arts university with a Christian foundation, similar to Keiwa College.

Even before transferring to ICU, I had started supporting mathematical research at universities in Asia [18] but after moving, I expanded beyond mathematics to broader activities: supporting students with various difficulties, assisting students with disabilities, participating in mountain village work camps in Thailand, and organizing service-learning programs in China, Korea, the Philippines, Indonesia, Thailand, India, and Kenya.

At the students' request, my wife and I hosted an open, discussion-style Bible study group at our university residence every Thursday night for about 16 years until my retirement. Sometimes only a few attended, but thanks to my wife's tea and cake hospitality, by the end, 20-30 students gathered weekly. We emphasized: "It's okay to say anything, or simply listen quietly, or just eat cake and chat." I believe many found it a comfortable, welcoming place.

Even now, six years after retirement and living far from the university, I continue small Bible study groups both in person and online. [19]

Also, the director of the children's welfare institution who once invited me sadly passed away from cancer shortly after I left for America, but his wife continued his work. Because the institution was close to ICU, I later became involved as a board member.

After retirement, during the COVID-19 school closures, I was asked to help children during their learning hours. I continued assisting children who had fallen behind academically afterward, especially during the pandemic, when the staff was severely overburdened.

[18] Mainly in the Philippines and China. Programs supported by the Japan Society for the Promotion of Science also existed.

[19] There's a record on the homepage: `https://icu-hsuzuki.github.io/biblestudy/`. There's also an email-based Bible reading program that's been ongoing since 2011: `https://icu-hsuzuki.github.io/science/bible/brc.html`.

3 Encounter with Artificial Intelligence through AlphaGo

3.1 The Shock of AlphaGo

[no.10]

As I mentioned earlier, I played Go when I was a child. In 2016, an artificial intelligence (AI) developed by a company called Google DeepMind defeated Lee Sedol, a player who had repeatedly been crowned world champion. In fact, in chess, an AI called Deep Blue, developed by IBM, had already defeated world champion Garry Kasparov back in 1996. By this time, AI had also reached a level in shogi where even top professional players could no longer win against it. However, it was widely believed that it would still take a long time before AI could compete seriously in Go. I watched the match live, and I was stunned. What was shocking was not merely that the AI won, but that it played several moves considered absolutely bad by human standards, yet still emerged victorious. This led me to start researching the developer of AlphaGo, Demis Hassabis, and his ideas.

3.2 Demis Hassabis

[no.11]

Demis Hassabis was born in London in 1976 to a father from Cyprus and a mother from Singapore. He learned chess at the age of four, later leading the British junior chess team to success in international tournaments. At 17, he co-developed a simulation game called Theme Park and started a company. He skipped two academic years and studied computer science at Cambridge University. Afterwards, he pursued graduate studies in neuroscience, where he obtained a PhD researching how the brain works. Specifically, he studied the hippocampus—the part of the brain responsible for memory—and discovered that when the hippocampus shrinks and memory becomes impaired, it also becomes difficult to imagine future events. This finding highlighted the connection between past memories and the ability to plan for the future, and he went on to further elucidate its mechanisms.

When IBM's Deep Blue defeated Garry Kasparov, Hassabis felt that "this AI is not such a big deal—Kasparov can do many things, but this AI can only play chess." This motivated him to set a goal: to develop Artificial General Intelligence (AGI). Believing that understanding the brain would be crucial, he pursued neuroscience at the graduate level. When asked if he had always been interested in the brain, he replied humorously that at the time he entered graduate school, the only thing he knew about the brain was that it was "inside the skull."

DeepMind was founded in 2010, but Hassabis admitted that for the first two years, he couldn't even pay salaries to employees. However, they eventually developed an AI capable of mastering 49 different Atari arcade games–such as Space Invaders and Breakout—by playing each game 300–600 times and outperforming human players. This achievement led to Google acquiring DeepMind.

Afterwards, AlphaGo took on the challenge of Go. Right after winning the first match (out of five), Hassabis was interviewed and asked what he envisioned for the future of AI. He answered:

"What I'm really excited about is using this kind of AI to help advance science faster.

I'd love to see AI-assisted science, where AI research assistants can take on much of the drudgery, highlight interesting phenomena, and find structure in massive data sets, presenting those findings to human scientists who can achieve breakthroughs faster."

3.3 The Evolution of AlphaGo

[no.12]

AlphaGo's victory over top Go professionals occurred in 2016. However, the following year, Google DeepMind announced AlphaGo Zero. While AlphaGo had been trained using game records from human professional players, AlphaGo Zero was trained only by knowing the basic rules and then playing games against itself, with no reliance on human data. This approach demonstrated that for "perfect information games"—games unaffected by luck, like chess, shogi, Go, and Othello—it is possible to create powerful AIs using a single program, simply through self-play and reinforcement learning. As a result, DeepMind released AlphaZero, an AI that surpassed all existing chess and shogi programs at the time.

Later, they developed MuZero, an even more sophisticated AI that learned not only how to win games, but also discovered the goals of games purely through playing—without being told the rules beforehand.

You may know even more about this area than I do, but of course, games are not limited to board games. By modeling real-world problems as games, researchers think about what skills are needed to master those games—and how those skills might be applied to solving other types of problems. They may also identify the key technologies necessary for solving specific tasks and frame those tasks as specific games to tackle.

3.4 Strengths of DeepMind's AI (Personal View)

Many other groups were conducting AI research for games at the time, but why was Demis Hassabis's Google DeepMind so successful? First, while focusing on the most difficult challenge—Go—they did not limit themselves to specific games like Go, chess, or arcade games. They framed their work in the broader context of "perfect information games" and sought universal problem-solving methods. In this sense, they were taking the first step toward building AGI.

This approach might seem surprising to some, but it's actually quite common in mathematics: For instance, even though the sum of the interior angles of a triangle usually requires measuring and adding each angle, by proposing and proving that "the sum of the interior angles of any triangle is always 180 degrees," one can understand the result universally, without depending on individual cases. Generalizing a problem often reveals its deeper essence.

Second—and I think this is even more crucial—DeepMind focused not on what to teach computers, but on understanding how learning itself occurs, based on neuroscience—how humans learn. They then implemented those findings in AI. Technically, this approach is called deep reinforcement learning. By combining it with neural networks and deep learning, which were already making progress, they achieved remarkable results. Although Hassabis did not invent reinforcement learning itself, his breakthroughs at DeepMind were extraordinarily significant.

3.5 From Teaching to Learning

[no.13]

In the field of education, the shift from "teaching" to "learning" has long been advocated. In Japan's university education, too, since around the year 2000, the slogan "from teaching to learning" has been increasingly emphasized. However, specific methods to realize this shift—particularly those connected to neuroscience—have been slow to develop. The effectiveness of teaching, after all, should be measured by how much it promotes student learning. I, too, started working on this idea around 2000, applying it to my own teaching. But I have to admit, it's very difficult. Learning in AI research seems to have advanced far more rapidly.

Starting from the story of AlphaGo, I've talked about learning here. Interestingly, recently a top Japanese Go player said, "Today's top Go players have become stronger than the AlphaGo that defeated Lee Sedol." In other words, the existence of strong Go AI has allowed humans to study with it and become far stronger than before. Isn't that amazing?

Borrowing Demis Hassabis's words, by skillfully using an AI research assistant, it's possible to dramatically improve one's Go skills. At the same time, some top players say, "Today's latest AI is so strong that even when we study its moves, we can't always understand why it makes certain decisions."

AlphaGo, which shocked me, came in 2016. By 2019, when I reached retirement age, I had decided to study AI and data science—the engines behind AI thinking. Although I don't aim to develop AI myself, I am convinced we are entering a major era of transformation, where AI will fundamentally reshape society and learning—both in positive and negative ways.

4 Progress of Artificial Intelligence (AI)

4.1 Nobel Prize in Physics and Nobel Prize in Chemistry

[no.14]

While the 2024 Nobel Peace Prize was awarded to the Japan Confederation of A- and H-Bomb Sufferers Organizations (Nihon Hidankyo), are you aware of the recipients of the Nobel Prize in Physics and the Nobel Prize in Chemistry?[20] The 2024 Nobel Prize in Physics was awarded to Geoffrey Hinton and John J. Hopfield, while the Nobel Prize in Chemistry went to David Baker, Demis Hassabis, and John Jumper. You might recognize the name Demis Hassabis, whom we discussed earlier. In fact, all five recipients were awarded for research related to AI. I imagine many people, including those in the field, were quite surprised by this.

4.2 Achieving Human-Level Performance in MNIST Recognition

[no.15]

When did AI begin making such explosive progress? Personally, I feel it started around 2013, when technologies like neural networks finally achieved human-level accuracy in recognizing handwritten digits with the MNIST dataset. Previously, as my neighboring research lab was working on image recognition, every time graduation theses or master's theses were presented, it felt like true achievement was still far off. However, around this time, we started witnessing rapid, visible advancements.

4.3 AI Development Toward AGI

[no.16]

Let's briefly introduce the fields where AI is currently advancing.

4.3.1 Progress in Image Recognition and Image Generation

Handwritten character recognition, which we mentioned earlier, is one example. You may be familiar with Google Photos, where photos are categorized by faces. Moreover, from around 2021–2022, AI began generating new images and videos. Facial recognition is now also used for immigration checks at airports and as part of Japan's My Number Card health insurance system.

4.3.2 The Revolution in Natural Language Processing (NLP)

One of the most significant revolutions is in Natural Language Processing (NLP). Transformers, introduced by young researchers at Google ("Attention Is All You Need," 2017[1]), and BERT (Bidirectional Encoder Representations from Transformers, 2018[2]) brought about dramatic improvements in understanding meaning and boosted the precision of tasks like translation across multiple languages. Geoffrey Hinton, one of the 2024 Nobel Physics Prize recipients and often called the "Godfather of AI," was also involved behind the scenes.

Now AI can calculate the probability of the correct words to fill in blanks within sentences, dramatically improving its ability to handle referential expressions like pronouns.

For instance, I've been using the language learning app Duolingo partly to observe AI development. Recently, it's increasingly presenting fill-in-the-blank exercises where multiple answers could be correct, reflecting these AI techniques.

After mastering natural language, post-ChatGPT models like GPT-4.0[9] have become highly intelligent conversation partners capable of responding naturally in any language. GPT stands for "Generative Pre-trained Transformer," emphasizing its basis in generative pretraining and Transformer architecture. Today, models that can handle natural language are often referred to as Large Language Models (LLMs).

The ability to process natural language has also significantly impacted programming, reducing the need for humans to first learn specialized computer languages.

[20]Nobel Prize official site: `https://www.nobelprize.org`; Physics Prize: `https://www.nobelprize.org/prizes/physics/2024/summary/`; Chemistry Prize: `https://www.nobelprize.org/prizes/chemistry/2024/summary/`

4.3.3 Reinforcement Learning

[no.17]

As discussed with AlphaGo (2016), AlphaGo Zero (2017), AlphaZero (2017), and MuZero (2019)[4, 5, 6, 8], AI can now learn by itself in changing environments.

Previously, human instructors had to provide initial data and thinking patterns, but now AI can learn independently—and even teach humans. However, applying reinforcement learning to broader systems like economies or societies requires massive computing resources and energy, presenting new challenges.

For example, while AI could theoretically find solutions to global warming, doing so could ironically accelerate global warming by consuming large amounts of energy.

Perhaps AI will eventually develop smarter, more energy-efficient ways of learning. Demis Hassabis has said that developing AI that can create plans to solve problems is now a key objective.

4.3.4 Expanding Applications to Real-World Problems

AI applications in real-world areas are also expanding rapidly: self-driving cars, fintech (financial technology), and robotics, to name a few.

Demis Hassabis and his team's Nobel Prize-winning work involved AlphaFold 2, which greatly advanced protein structure prediction.[21]

Proteins, made up of amino acids, are fundamental to all life, but understanding their 3D structures had been a long-standing unsolved challenge. Correctly predicting these structures is crucial for chemistry and medicine, particularly drug discovery for difficult diseases.

During his student days, Demis Hassabis was inspired after hearing passionate discussions about this problem. After witnessing AlphaGo making brilliant moves in Go, he believed AI could also solve the protein folding problem—and he was right. Hassabis and his team developed a nearly perfect solution and freely provided a massive protein structure database.

John Jumper, who contributed technically, was also co-awarded the Nobel Prize in Chemistry.

David Baker, the third laureate, used this information to synthesize new proteins and even created a computer game, Fold.it,[22] encouraging players to contribute ideas for his research.

4.4 How Should We Engage with AI, and What Are the Dangers?

[no.18]

4.4.1 Debates Over What AI "Cannot Do" Are Now Futile

AI technology is advancing rapidly. Geoffrey Hinton, one of the Nobel Physics Prize winners, resigned from Google two years ago to focus on warning about the dangers of AI, fearing that AI might someday dominate humans.

[21] AlphaFold 3 has also been released: `https://blog.google/technology/ai/google-deepmind-isomorphic-alphafold-3-ai-model/`

[22] `https://fold.it`

Meanwhile, many intellectuals discuss what humans can do that AI cannot. Given that explosive progress became evident only around 2013, only about ten years have passed. Personally, I think even the most brilliant humans today still barely understand AI's true capabilities, limitations, and dangers. What the world will look like twenty years from now is likely beyond anyone's prediction.[23] We truly live in turbulent times.

4.4.2 The Utility of AI Is Being Rapidly Validated Across Fields

Around a year and a half ago, there were open letters—including signatures from prominent AI researchers—calling for a temporary halt in AI development due to unknown dangers.[24] I personally thought a pause might be wise. However, it now seems clear that progress cannot be stopped.

AI's usefulness is explosively being demonstrated across diverse fields. For instance, Japan is using AI to monitor sewer pipe degradation, a major cause of road collapses. In the medical field, patients desperately awaiting new drugs cannot afford a development pause. Similarly, efforts to predict and mitigate disasters to save lives are progressing.

Of course, serious risks are already being highlighted. For example, crimes involving smart tags like AirTags,[25] or concerns that recommendation systems and social media may erode diversity and deepen societal divisions. Traditional media, built collaboratively by many editors, is also declining, making it harder to judge the reliability of information or detect fake news.

4.5 We Do Not Yet Fully Understand What Is Truly Dangerous

So, how should we face this situation? The reason I chose to discuss AI today is because I want the younger generation—people like you—to take an interest and think about these issues. How should we engage with AI? How should we interact with it? What should we be cautious about? There still seem to be many things we do not understand.

During the Industrial Revolution, for example, fatalities from smog pollution in London occurred relatively quickly, but probably no one foresaw the long-term consequences such as global warming. This time, we are in the midst of an information and intelligence revolution, which may prove even more complex.

Although I am not directly involved in AI development, I do think about its societal impacts, so I would like to briefly share some of my thoughts. Since my understanding is still immature, there is a high possibility that I am mistaken. I hope this can serve as a starting point for discussion, and I would like you all to think about it together with me.

First of all, we must recognize that when something becomes possible, it always has two sides. This is often referred to as the issue of "dual use," a topic that has been repeatedly discussed throughout history. One well-known example is the Haber-Bosch process, which enabled the industrial production of nitrogen-based fertilizers and led to

[23] Historian Yuval Noah Harari expresses a similar view in this interview: `https://www.youtube.com/watch?v=1CFbZ-1_HFQ`

[24] Pause Giant AI Experiments: An Open Letter: `https://en.wikipedia.org/wiki/Pause_Giant_AI_Experiments:_An_Open_Letter`

[25] While designed to help prevent lost items, smart tags can be misused for theft or stalking by tracking locations without consent.

an agricultural revolution that reduced hunger. At the same time, this same technology rapidly advanced the production of powerful explosives[26].

Substances developed as pesticides came to be used as chemical weapons. Sarin gas is one such example. It was actually used in mass killings at concentration camps and, in Japan, was used in the Tokyo subway sarin attack. Nuclear technology, too, has both peaceful applications and destructive ones, such as atomic bombs. Even the Internet, which all of you use, was originally developed for military purposes and is still seen as a means of securing military superiority.

Demis Hassabis has stated that both the usefulness and the dangers of AI must be considered not only by engineers but also by a wide range of people. He emphasizes the dual-use problem mentioned above and the need for something like international agreements. As a leading figure at the forefront of AI, he seems to feel a strong sense of responsibility, but at the same time, I believe he is also acknowledging that we still don't fully see where AI is headed.

I believe the first step is to recognize how little we ourselves actually understand, and to keep learning. Second, we must avoid emphasizing either usefulness or danger alone, and instead always study both sides calmly and responsibly. Furthermore, humans tend to be easily swayed by the sense of usefulness, convenience, or benefit, often leading to self-centered value judgments. That is why we must prioritize perspectives beyond our own, and always ask ourselves: Could this be dangerous for someone else? Each individual involved must take responsibility when making decisions.

What do you think? Perhaps this is also an issue we need to consider together—with AI.

5 Love, Faith, and Hope

[no.19]

5.1 Welcoming, Building Trusting Relationships, and Pursuing Fairness

[no.19]

Since this is a time called "Chapel Assembly Hour," I would like to speak from the words of the Bible about something I consider important.

In 1 Corinthians 13:13, we find the following words:

> And now these three remain: faith, hope and love. But the greatest of these is love. (New International Version) [27]

It says that faith, hope, and love will remain forever, and the greatest of these is love. So then, which of the three is the second greatest, or most important? Since it isn't written, I think the correct answer is that we don't know—but since faith is listed first, perhaps it is faith. So for now, I'd like to think about these three in order: love, faith, and hope.

[26] The same technology enabled the synthesis of explosive materials (such as TNT and gunpowder), which were used in weapons manufacturing during World War I and II.

[27] And now these three remain: faith, hope and love. But the greatest of these is love. (NIV)

5.2 Love, Faith, and Hope

Love is a word that has a good feeling to it, and perhaps many of you like it. In the original Greek used in this passage, the word for love is *agape* —a noun. The corresponding verb is *agapao*. When you look up the meaning in an English dictionary, the first entry is "Welcome," so I think the original meaning may have been to welcome. I've only studied a little Greek myself, but there are many knowledgeable professors at Keiwa College, so please feel free to ask them. In the Bible, I think "welcoming" includes welcoming those who are hard to welcome—in other words, those who are troublesome or difficult.

Actually, when I was in 3rd or 4th grade, I read several biographies of great people of the world. Among them, I read that Napoleon said, "The word 'impossible' is not in my dictionary," which I thought was very cool. I wondered what my version should be, and decided on "The word 'troublesome' is not in my dictionary." I used that expression earlier, but of course, this doesn't mean I never use the word "troublesome"—rather, it means that I try not to avoid things just because they are troublesome.

Later on, I gradually came to realize that what's "troublesome" is not just tasks or jobs, but people. Moreover, I realized that I myself am probably a rather "troublesome person" to others—and perhaps even to myself.

How about you? Are there people around you that you find hard to welcome—people who seem "troublesome"? People who seem hard to get along with, who say or do hurtful things, or who make you think the only way to avoid conflict is to stay away from them completely?

Considering the divisions in today's society, I think one of the biggest challenges is how to interact with people we cannot welcome—those we find difficult. Taking some distance may be one option, but sometimes that's not possible. Then should we just close our eyes and say, "I welcome you, whatever happens"? That likely won't work out well. What would you do?

As for me, I have a kind of mantra I say in my heart: "Please teach me about yourself." Even if I think what the person is saying or doing is problematic, I probably don't really understand why they are doing it. We don't know what's going on with other people—what background they come from, why they do or say certain things. In particular, we don't know their pain, sorrow, or suffering—or their joys, what they hold dear, or how God has been guiding and loving them.

Even if I approach someone with the feeling of "Please teach me about yourself," the situation won't change overnight. But with that attitude, without denying the person themselves, I hope we can gradually build a relationship. I believe that just as God cares for me, He also cares for that person.

Now, what about the next one—faith? In Greek, it's pistis —which also means trust or faithfulness. Referring back to the earlier situation, I think it means trusting in the God who loves that person, and gradually building a trusting relationship with them. The challenges in front of us, or the conflicts we seem to face, probably won't be easily resolved. Even so, we should aim to build trust—with the mindset of "Please teach me about yourself."

Next is hope. What is hope? What kind of hope do you have? I think the hope mentioned in this Bible verse refers to the hope that God's will shall be done. In other

words, that people will do what pleases God, or come to live in a way that pleases Him. What exactly that means isn't always clear, but I think it could include the improvement of relationships with those we find troublesome. To me, this is the hope for a world where each person, as someone loved by God, can live with dignity—in that sense, a fair and just society. This won't come about easily. Still, with that hope, and with the attitude of "Please teach me about yourself," I believe we can gradually build trusting relationships. What do you think?

When I said "seeking what pleases God," this could also be described in biblical terms as seeking God's kingdom, God's righteousness, or God's justice. Even without using the word "God," it might be simply called the pursuit of justice.

I often tell myself: "Justice comes third." That is, it's the third most important thing. I mentioned earlier that the order of faith, hope, and love might be love, faith, then hope—and I also said that hope may be related to justice. So in that sense, justice is third. What's most important is having a welcoming heart. When we encounter things we can't accept, rather than immediately criticizing them with "correctness" or judging them as wrong, we should approach them with a mindset of "Please teach me about yourself," and gradually build trust. Then, on top of that, we can slowly seek fairness and cooperation together.

We only know part of the truth. If we push "rightness" to the forefront, it inevitably causes division. There are many versions of "rightness," but I think we should aim for fairness that more people can accept while living this same moment together.

Patience is also necessary. When we're not feeling well, our brains resist using energy and we fall into a simplification bias. In those times, maybe try stopping your thoughts for a bit and refreshing yourself with sports, a walk, or something like that. Listening to music, or even reading manga (though I don't do it much myself), might also be good. Taking care to rest your brain is important—so perhaps don't spend too much focused time playing games.

There are many irrational or troubling things in the world. Please do work to improve the things you can change. But there are also things that can't be changed. There are times we will clash with others. In those times, without rushing, quietly say "Please teach me about yourself" in your heart, and try to learn what lies behind the situation.

6 Summary

6.1 How Should We Engage with AI in Learning?

[no.20]

As you begin your university studies, how should you engage with Artificial Intelligence (AI)? Let's take a moment to summarize some thoughts on "Learning and AI."

Even as learning evolves, the central agent of learning is still you. In education, what matters is a mentor-like presence who can provide tailored advice to each learner. While the number of students one teacher can guide is limited, AI has the potential to explain concepts, offer hints, and pose additional questions based on individual understanding. As I mentioned earlier, tools like Duolingo have already incorporated some of these features.

However, it's difficult for others, including AI, to fully understand why a person struggles to comprehend something, or to truly grasp that individual's hardships, pain, suffer-

ing, sadness, or joy. I believe that our past, present, and future experiences of pain and joy contribute to our unique value as individuals and shape our "dignity." Although analysis is possible, I hope we can use AI collaboratively to better understand these personal experiences.

6.2 Anna Karenina Principle (AKP)

[no.21]

In Leo Tolstoy's novel "Anna Karenina," the famous opening line is: "All happy families are alike; each unhappy family is unhappy in its own way." In data science, this is referred to as the Anna Karenina Principle (AKP): Happiness arises when multiple conditions are met, while unhappiness stems from one or more missing conditions. Thus, unhappiness is diverse and addressing the needs of each unhappy individual is very challenging. It is not enough to say "things usually go well" because the reasons for failure are numerous and varied, and so is the suffering that comes with it. We must be attentive to outliers, as the essence often lies hidden there.

6.3 My Treasures

[no.22]

At the beginning of my talk, I shared my life journey. Likely, none of you will live exactly the same way. Still, I shared this to tell you that people like me exist and to talk about what I treasure. My life treasures are the irreplaceable individuals I have met who have influenced me: those I disagreed with during school protests, friends I traveled with in Southeast Asia, people who openly said they disliked Japanese, those I met abroad and in Japan, at universities, in children's homes, and at facilities supporting people with disabilities. And my family: my spouse and I have five children and six grandchildren. I am also grateful for meeting all of you here today. I hope you, too, will cherish your encounters. These will become your treasures and the foundation of a rich life.

Meeting diverse others can itself be a treasure. As Misuzu Kaneko once wrote in a children's song: "Everyone is different, everyone is good." Differences can be troublesome, but by overcoming those challenges, new worlds can open.

6.3.1 "Me and the Little Bird and the Bell" by Misuzu Kaneko

[no.23]

Even if I spread out both my arms, I can't fly through the sky at all,

But the little bird that can fly Can't run fast on the ground like I can.

Even if I shake my body, I can't make a beautiful sound,

But the ringing bell can't Sing many songs like I do.

The bell, the little bird, and me—

We're all different and all wonderful.

6.4 Can We Trust AI?

[no.22b]

Lately, I often ask AI questions and enjoy the intellectual exchange. But can we trust AI's answers? Even aside from AI, we are surrounded by fake news. While AI might

be useful for general knowledge, it certainly doesn't have all the answers for individual, specific problems. What should we do? I believe the diverse opinions and perspectives of both AI and people are important. There may not always be a clear conclusion, but we should try to listen to people from different backgrounds. The idea of "everyone is different, everyone is good" may be key.

I also think it's important to hear from people of different generations. People from different age groups have different life experiences. I visit someone over 20 years older than me weekly, and these conversations are precious. I also value speaking with younger people at Bible study groups and children's homes.

People with disabilities or serious illnesses may also offer unique perspectives. I encourage you to treasure friendships across generations and backgrounds. Even long-held beliefs may be reexamined in a new light. Building trust and welcoming others takes energy, but it is worthwhile.

6.5 Don't Turn Daily Life Into a Mere Routine

Recently, I recalled a story my father once told me about bricklayers, likely originating from Aesop. When asked what he was doing, one worker said, "Isn't it obvious? I'm just laying bricks. It's hard work." The second replied, "I'm building a wall to support my family." The third said, "I'm building a church where many will be blessed." This story is often used to illustrate the importance of purpose. What are your values as you study and work?

I hope you do not treat your daily life as mere routine. Putting your heart into each task gives it meaning—whether attending class, doing assignments, or chatting with friends. When done with care, each action can hold deeper significance. [no.24]

Keiwa College is a liberal arts institution. Liberal arts education, such as that offered at ICU where I once worked, has roots in the artes liberales of Europe and emphasizes broad education and critical thinking. These programs have historically cultivated civic leaders. I believe liberal arts should go even further, nurturing global citizens who can thrive wherever they are. I don't know where life will take you, but I hope you enjoy learning and build a foundation as global citizens among diverse people.

Live with joy. Don't reduce life to a routine. I hope you live vibrantly.

6.6 Why Not Try Using AI?

[no.25]

That concludes my talk.

If you haven't tried using AI yet, I recommend Poe. It's available as a mobile app and a website. With Poe, you can use ChatGPT, Google Gemini, Perplexity, and more. Give it a try—just be sure to follow your university's rules.

Language-learning apps like Duolingo are also great. I often wished I could speak the language of the people I met abroad. Though I never had enough time to study then, I know people are happy when spoken to in their own language. I now study several languages to better connect with diverse people. If you're open and curious, even a little effort in another language can go a long way.

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