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PHILOSOPHY INSPIRES TECHNOLOGY INNOVATION

THE ENRYO LEARNING EXPERIENCE — ON EMPATHEME METHOD

SAKAGUCHI Rikkō 坂口立考

1. Introduction

Current society is overflowing with material and brimming with information. The abundance of knowledge available through the internet characterizes the ordinary lives of people around the globe. The smartphone is an indispensable tool to carry at all times. Computer-based technology has become ubiquitous. Artificial intelligence is a name given to the collection of technologies and services that provide analysis and judgment in the user's stead.[1] Knowingly or unknowingly, people take contemporary life for granted.

1 YOSHIDA Yoshikazu 吉田善一.「井上円了と人工知能」[Inoue Enryō and artificial intelligence] in『論集：井上円了』[Essay collection: Inoue Enryō], ed. by Inoue Enryo Research Center 井上円了研究センター (Tokyo: 教育評論社, 2019), 368–389.

While the benefits of convenience and productivity have a significant influence on people's daily lives, concerns are also growing. Excessive use causes anxiety that damages the human body. Over-dependency deprives a healthy mind. Misbehaviors on social media are harmful not only for the individual but also for the community. A busy schedule filled with the incessant rush of information unbalances life. Worries and uneasiness leave little room for self-reflection. Still, the benefits and disadvantages are two sides of the same coin.

Today, the computer-networked world is a shared environment for anyone. It spreads across countries, societies, and generations. It is almost impossible for ordinary individuals to grasp the whole picture regarding the real benefits they receive and the hidden sacrifices they make; for example, concerning how their information is used when large global businesses around the world offer services through the internet that collect detailed information regarding the user's behaviors. In many cases, such information gathered in return for free service is one of the vehicles to generate profits through their business models. People can only assume, if they will, that the trade-offs are worth it and that they bring benefits from the black box of technology.

Viewed this way, technology plays a significant role in the human mind, not in the sense of convenience, productivity, and efficiency that bring business benefits, but more in the sense of cultivating and exploring the innate human abilities. As Brian ARTHUR puts it, "a technology is a phenomenon captured and put to use, or a set of phenomena put to use."[2] It is an extension of human imagination used to create a system that helps human abilities. Because humans build technology, there is always a need for a philosophy that inspires technology in a way that inspires human imagination.

From time to time, in human history, wisdom helped shape visions. The contemporary world requires a new concept of technology, thus of philosophy. Today, there is a strong need to create a model with concrete methods that anyone can use to practice nurturing everyday life, with the given conditions described. Philosophy can inspire technology, and technology can incorporate a philosophy that anyone can practice. Such an initiative to harmonize philosophy and technology is critical, especially in these difficult times.

2 Brian W. ARTHUR. *The Nature of Technology: What It Is and How It Evolves* (New York: Penguin Books, 2009).

For this purpose, the life and philosophy of INOUE Enryō is a perfect model. In the early Meiji period of Japan, Enryō pioneered school and social education. Not only did he advocate and promote the essential roles that philosophy plays, but he lived his entire life devoted to practicing his philosophy to serve people. Enryō explored through his life the wonder of the universe and the human mind. In the second half of his life, he earnestly traveled throughout Japan to spread that philosophy. He gave lectures while directly interacting with the local people more than 5,000 times.[3] The actions of Enryō expressed the philosophy that he taught, practiced, and lived.

Only four months before his sudden death in 1919, Enryō expressed in his work "My Philosophical Mission" that his mission was to popularize philosophy and make philosophy practical.[4] He intended to use social education as the method for making philosophy practical. In 2019, the hundredth anniversary allowed Empatheme Foundation to tread the footsteps of Enryō and collaborate with the Inoue Enryō Research Center to promote Enryō's soul.[5]

The Enryo Learning Experience is a new learning environment based on Enryō's philosophy and technology that incorporates the essence of his philosophy into its implementation. This paper discusses the creation of the Enryo Learning Experience as a philosophical application of newly invented technology, along with methods to help practitioners learn Enryō's philosophical teachings. It presents a viable new model for a unique learning platform that integrates technology into philosophy and shows how philosophy inspires technology innovation within the context of the contemporary world.

2. Method

2.1 Purpose of the Enryo Learning Experience

The Enryo Learning Experience is a new concept for a learning platform that works for all practitioners. It consists of a smartphone application (i.e., the Enryō app), the Empatheme system and methods, and the Enryō content, seamlessly integrated into the platform. The purpose of the Enryo Learning Experience is to help in learning to culti-

3 MIURA Setsuo 三浦節夫.『井上円了：日本近代の先駆者の生涯と思想』[Inoue Enryō: the life and thought of a pioneer of Japanese modernity] (Toyko: 教育評論社, 2016), 461.

4 INOUE Enryō 井上円了.「哲学上に於ける余の使命」[My mission in philosophy],『東洋哲学』[Oriental philosophy] 26, no. 2 (1919): 83–93. Trans. by Dylan Luers TODA. "My Philosophical Mission (1919)," *International Inoue Enryo Research* 3 (2015): 42–49.

5 Empatheme Foundation is a non-profit charitable organization in Tokyo, which provides people with practicing methods and a technology platform based on the unique inventions of Empatheme®. The author is an inventor of Empatheme and serves as the executive director of Empatheme Foundation. See https://ja.empatheme.org.

vate calmness, nurturing empathy, and inspiring wonder through interacting with Enryō's words. It goes beyond presenting a model that theoretically works and actually provides it for people's real-life practice.

The meaning of the Japanese name for the platform, *Enryō Gakusha* 円了学舎, is two-fold. One is the learning platform that follows Enryō's philosophy. It features the philosophical implementation inspired by Enryō. One hundred years after his death, users of the platform can experience close interaction with Enryō's philosophy as if Enryō was present. The other meaning is the living environment for practice, which helps users internalize Enryō's philosophical passages through voice-based interactions. Although the word *gakusha* 学舎 implies a school or a physical venue, where typically the teachers teach students, Enryō's belief in education emphasized a learned character building through interactions and sharing.[6] While taking advantage of the technology platform that extends communication beyond the constraints of time and location, the Enryo Learning Experience provides a way of learning, practicing self-reflection, and sharing thoughts and feelings with colleagues and teachers remotely.

In the contemporary world context, it is essential to focus on learning environments that overcome the lack of opportunities for an individual to practice through giving output, such as vocalizing and writing, rather than merely input, such as reading the text alone. The origin of the English word "educate" came from the Latin verb "educare," which means to bring up, nurture, let grow up. In Japanese, the word popularly used to translate this, *kyōiku* 教育, means to teach and to raise, implying a teaching point of view. Enryō's view on education was more about learning and nurturing character by helping growth rather than just acquiring knowledge. The philosophy of the Enryo Learning Experience is to establish an environment of tranquility, trustworthiness, and engagement, where the practitioners can learn on their own.

2.2 Philosophy of the Enryo Learning Experience

The method for creating the Enryo Learning Experience follows three steps. First, it defines the essential principles that guide development. The Inoue Enryo Research Center produced *Enryō's 105 Essential Words*『円了金言集105』, compiled from the vast collection of Enryō's work.[7] Enryō's thought is popularly understood as basing all learning in philosophy.[8] The foundation of the Enryo Learning Experience lies in the

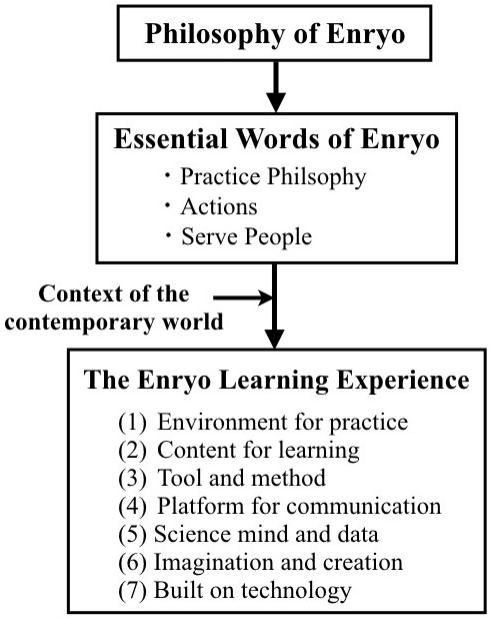
6 TAKEMURA Makio 竹村牧男.『井上円了：その哲学・思想』[Inoue Enyō: his philosophy and thought] (Tokyo: 春秋社, 2017), 254–266.

7 Inoue Enryo Research Center 井上円了研究センター, ed.「円了金言集105」[Enryō's 105 essential words].

8 See for example the work of TAKEMURA, as cited above in footnote 6.

philosophy of Enryō in the most practical ways that are useful to the practitioners.[9] The focus is on practicing Enryō's words and internalizing them. The edition of *Enryo's 105 Essential Words* features quotes and literal explanations. It not only works as a concise guide that extracts Enryō's teachings but also structures the fundamental guiding principles that characterize the implementation of the Enryo Learning Experience (Fig. 1).

Secondly, it categorizes these essential 105 words to recapture the significance of Enryō's philosophy in colloquial language. Three key ideas are: (i) philosophy for practice, (ii) the importance of actions, (iii) the need to serve people. The process of essentializing the core principles is necessary for development. The Enryo Learning Experience is an environment where practitioners can learn, not only studying philosophy, but also practicing philosophy in the sense of living up to it, taking action, and serving the world in which one lives.



(Fig. 1 Method structure)

Thirdly, it considers the context of the contemporary world and makes sure that the core principles reflect this. It then lays out the building blocks for implementation. The reflection of Enryō's philosophy in today's world is a necessary process. Based on this assessment, the following seven guiding principles structure and characterize the Enryo Learning Experience. These seven principles have two parts; the first part (1)–(4) covers what it is from a developmental perspective, i.e., what it does. The second part (5)–(7) covers how it works and explains what unique value it has. With these seven elements combined, the Enryo Learning Experience gives an example of how philosophy inspires technology implementation.

9 INOUE Enryō 井上円了.『井上円了選集』[Selected writings of Inoue Enryō], 25 vols. (Tokyo: 東洋大学, 1987–2004).

(1) Create an Environment for Practice in Daily Life

The Enryo Learning Experience helps and encourages practice that nurtures the unconscious mind, given the notion that today the incessant intake of information without proper reflection threatens human potential. Enryō reiterated that building good habits cultivates the unconscious mind.[10] The Enryo Learning Experience is an environment where the methods practiced tightly integrate the teaching materials and lesson content to encourage output over input. It is the creation of an environment in which Enryō's words of activism, his spirit of action, his belief in overcoming obstacles, and his wholehearted interaction with people helps to inspire practitioners. To acquire the action-oriented behavior that Enryō encouraged, it is essential that one creates the space and time needed for daily practice.

(2) Engaging Content for Learning

The Enryo Learning Experience is a place to learn with inspiring content. Having the essential words of Enryō vocally expressed makes it seem as if Enryō were there, talking directly to the practitioner. The use of voice in itself, based on the shared philosophy, is a powerful way of learning. The sense of calmness, tranquility, and ease of practicing constitute an essential factor for learning. Enryō devoted his life to engaging with learners through his lectures and his storytelling about mysteries and wonders. In the same way, the Enryo Learning Experience offers content that captures the spirit.

(3) Provide a Simple Tool with a Method

The Enryo Learning Experience is a simple tool. The lesson content is simple, easy to read, and interactive. Although Enryō interacted directly with ordinary people, the only source of Enryō's philosophy today is the vast collection of his works. They are not necessarily easy to read for beginners. Therefore, converting Enryō's words from the academic collections into a handy form of engaging content motivates learners. The Enryo Learning Experience uses a smartphone as a handy tool. However, unlike today's popular apps designed to drive the consumption of time using, the Enryō app is solely for the benefits of practicing. The primary focus is to inspire intrinsic human abilities using the body, which may be forgotten in ordinary life. It enables calming, slowing down, and using imagination.

10 「無意識を鍛える」[Cultivate the unconscious mind] in「円了金言集 105」[Enryō's 105 essential words], ed. by Inoue Enryo Research Center 井上円了研究センター.

(4) Communication Platform for Interacting and Sharing

The Enryo Learning Experience is a communication platform where practitioners can closely interact with vocalized words of Enryō. The human voice has power and produces resonance in the unconscious mind.[11] Creating an atmosphere where interactive communication is integrated into the platform is vital for such a feeling of engagement and connection.

Enryō's philosophy on education emphasized such interaction. Knowledge is not the only purpose of education. What matters is to cultivate the soul, nurture empathy, and inspire imagination.[12] When Enryō visited English people's homes, he was impressed by the style of communication between family members because they enjoyed chatting with one another. Enryō adopted the idea of having a conversation space over a cup of tea at the "dormitory" 寄宿舎 of the Philosophy Academy 哲学館.[13] Enryō highly valued interaction and mutual communication among participants and saw them as essential for learning. The Enryo Learning Experience reproduces such communication. In other words, it creates a learning community on the platform.

(5) Scientific Mind with a Sense of Wonder

Enryō's works on the concept of mysteries touch science deeply. Science is an interaction between humans and nature. It is imaginative work that seeks to find the laws of the universe that are invisible to the human eye. Enryō proclaims that the world is full of wonders, which the human mind can enjoy savoring.[14] Scientific methods help explore wonders.

The Enryo Learning Experience not only helps in practice but also in measuring the process of practicing moments by producing both qualitative and quantitative data that inspires reflection. In particular, new types of information about the self present

11 Ann KARPF. *The Human Voice: The Story of a Remarkable Talent* (London: Bloomsbury Publishing 2006); UMEDA Noriko 梅田規子.「心の源流を尋ねる」[Where mind came from] (Tokyo: 冨山房インターナショナル, 2011).

12 Empathy is key to understanding Enryō's philosophy. With respect to Enryō's admiration for Immanuel KANT, one might point to the *Critique of Judgment* (Cambridge 2000; Germ. 1790) where Kant defines humanity as being constituted by "empathy" (Teilnehmungsgefühl) and the competence to communicate oneself (§60). In order to imagine Enyrō's spirit, it might also be helpful to read Kant's *Groundwork of the Metaphysics of Morals* (Cambridge 1996; Germ. 1785) or Jean-Jacque Rousseau's *Emile: Or, On Education* (London: Penguin Classic, 2007; Fr. 1762). From the East Asian tradition, the *Analects* of Confucius『論語』and works of Shinran 親鸞 are particularly recommended for approaching Enryō's empathy.

13 "The Centenary of the Death of Enryo Inoue," https://www.toyo.ac.jp/about/founder/100anniv.

14 INOUE Enryō 井上円了.「妖怪学講義」[Lectures on mystery studies] in『井上円了選集』[Selected writings of Inoue Enryō], vols. 16–19 (Tokyo: 東洋大学, 1987–2004).

various opportunities for self-learning. It will also provide a wide range of new possibilities for further research, given the type of data to be made available. The combination of insightful minds inspired by natural wonders and support from the scientific methods constitutes the philosophy of Enryō.

(6) Imagination with Art Forms

The Enryo Learning Experience is an opportunity to imagine creating an art form. The act of creating art in itself is a powerful way to stimulate the human imagination. Enryō's life work of the Temple Garden of Philosophy is a clear example.[15] Nature inspires philosophy. The Enryo Learning Experience not only follows this idea, but also integrates art as one of the methods for practice. The Enryō app allows practitioners to generate art forms when practicing, reflecting, and communicating.

(7) Build on Technology with a Pioneering Spirit

The Enryo Learning Experience follows Enryō's pioneering spirit of innovation. Enryō was actively engaged in creating new ideas. His work *Dream of New Reform Devices* is a collection of inventive ideas that arose in his mind in the pockets of time during his travels or ordinary daily moments.[16] The key to innovation lies in an open mind that continuously interacts with nature. It is within the process of trying to see things differently in ordinary daily life and trying new things without hesitation. It requires the constant practice of mind for innovation.

The Enryo Learning Experience incorporates the newly patented methods of Empatheme, which extracts the practicing moments as a sequence of interaction units with the Empatheme system and gives depth of information regarding the unconscious mind of a self (i.e., the practitioner). For that purpose, whether or not such practicing moments happen in daily life is critical. The Enryo Learning Experience helps to produce such moments, and reflect them based on information that can be intuitively traced back and measured to reflect further and learn from it.

15 The best way is to visit the Temple Garden of Philosophy in Tokyo, but there are English introductory videos on the homepage of the park (www.tetsugakudo.jp/movie2) and it is possible to roam the Garden with Google Street View. Also, refer to *Guide to the Temple Garden of Philosophy,* ed. by Rainer SCHULZER (Tokyo: Toyo University Press, 2019).

16 See the introduction to INOUE Enryō 井上円了.『改良新案の夢』[Dream of new reform devices] in vol. 1-9 of『井上円了選集』[Inoue Enryō selected writings] (Tokyo: 東洋大学, 1987–2004).

Enryō had a global perspective. Likewise, the concept of the Enryo Learning Experience is global. The technology and its application are developed for users globally. Despite Enryō's original text being in Japanese (the Enryō app starts from the Japanese language), the Enryo Learning Experience has no boundary for implementation. It is a tool for anyone in the world who wishes to join in on practice in the future. While today's technology-led world presents challenges to humanity, efforts to overcome these challenges need to be based in the use of technology—not in the avoidance of it. The assumption is that if Enryō were alive today, he would advocate a new philosophy that deals with the latest technology as an extension of human abilities, and would be actively engaged in enhancing them. He would argue that people should not become too dependent on technology, but that they should not fear it, either. Technology should not be an obstruction to unrealized human potential. The Enryo Learning Experience intends to foster pioneering minds that combine fields that have been divided and segmented in the world of academia and education over the last hundred years.

2.3 Technology Method: Empatheme

2.3.1 Overview

The three main technical elements for the Enryo Learning Experience are: (1) the system that serves as the platform and the methods that support and encourage the practice; (2) the smartphone app that interacts with the user; and (3) the Enryō content based on the teachings of Enryō's philosophy in visual and audio format.

The first is the technical foundation of the platform for the Enryo Learning Experience. Empathetic Computing Methods are an invention recently patented in the United States.[17] Empatheme is a concept that involves the small moment of interaction when practicing something like self-reflection using natural bodily actions. Empatheme is a unit of interaction captured in a sequence, subtly resonating in real-time on the Empatheme application. These Empathemes are recorded, measured within the context, organized to produce unique information, and visually represented. The visualized symbols (such as colored beads and letters) work as a vehicle for empathic communication among the users in a group. The quantitative and qualitative data produced by the user's actions become a source of unique information about the self.

17 SAKAGUCHI Rikkō 坂口立考, ISHIKAWA Hidenori 石川英憲, et al. 2019. Empathetic User Interface, Systems, and Methods for Interfacing with Empathetic Computing Device. US Patent 10,409,377, B2, filed Mar. 8. 2018 and issued Sep.10, 2019. See the claims and examples that support the patent claims. The Japanese patent is at the following: https://www.j-platpat.inpit.go.jp/p0200.

The method of extracting the moments of natural human behavior originating in the unconscious mind helps in practice. Much research documents the role of the unconscious mind in determining human action. Timothy WILSON estimates that approximately 95% of our feelings, memories, and thoughts reside in "the adaptive unconscious mind."[18] Most of our daily actions are guided by the adaptive conscious, with a massive amount of information processed in the unconscious part of the brain. We learn to do routine things such as walking, speaking, and moving our fingers by repeatedly practicing the actions until they become automatic.[19] The concept of Empatheme is to access the adaptive unconscious indirectly—without disrupting the user's natural movements—in the form of a sequence of interaction units reflected, recorded, and organized as unique information that arises from the same process.

This patented invention method of extracting and segmenting the moments of natural human actions can combine another patented invention focused on the unconscious movement of the hand. Recognizing stillness of hand movement is a method for extracting and segmenting the moment.[20] The Enryo Learning Experience platform applies these methods to produce the flows of resonant interactions in harmony with human movements, providing data as Empathemes, which contain vocalized speech segmented by the breathing pauses. A breathing pause is also an unconscious act of natural human behavior. In that way, the practicing user can intuitively recognize the data visualization of Empathemes (i.e., Empagraph[21]) and use them for recursive reflection and imagination. The Empatheme patents document the technical implementation with various examples that serve as the foundation for the Enryo Learning Experience platform and its further development.

2.3.2 Technical Implementation

The Enryo Learning Experience system uses a smartphone as the Empathetic Computing Device that interfaces with and functions with the system. The following text, quoted in technical style following the patent outline submitted, describes the precise method of implementation. Empathetic computing is a name given to a system that in-

18 Timothy D. WILSON. *Strangers to Ourselves: Discovering the Adaptive Unconscious* (New York: Harvard University Press, 2002).

19 Daniel WAGNER. *Illusion of Conscious Will* (New York: MIT Press, 2002).

20 SAKAGUCHI Rikkō, ISHIKAWA Hidenori et al. Apparatus, System, and Methods for Interfacing with a User and/or External Apparatus by Stationary State Detection. US Patent 10,222,875, B2, filed Dec. 9, 2016 and issued Mar. 5, 2019. European patent application 16873960.5 has been granted and will be public after Apr., 2021.

21 Graphical representation of Empatheme information. See the images of Empagraph displayed in Method and Result.

teracts and creates a sequence of interaction units of the moments in practice, in real-time. In this case, the Enryō app on smartphones is the empathetic computing device that provides the method.

(i) How a sequence of interaction units is made:
A method of interfacing with an empathetic computing system, the method comprising:
receiving sensor data from sensors of an empathetic computing device, wherein the sensor data is generated responsive, at least in part, to user interaction with the empathetic computing device, and wherein the user interaction comprises a plurality of interaction units;
using the sensor data, associating one or more individual interaction units of the plurality of interaction units with a corresponding interaction unit type in accordance with pre-determined definitions of types of interaction units;
generating feedback for each individual interaction unit from the plurality of interaction units, wherein the feedback is based on the type of the individual interaction unit;
storing a sequence of the interaction unit types of the plurality of interaction units; and
generating a descriptor of the sequence, wherein the descriptor is based on contextual information derived, at least in part, from the sensor data.

(ii) An empathetic computing system comprising:
a plurality of sensors configured to generate sensor data based, at least in part, on user interaction with one or more empathetic computing devices, the user interaction comprising a plurality of interaction units;
a plurality of light sources provided on at least one of the one or more empathetic computing devices;
a processor communicatively coupled to the plurality of sensors and the plurality of light sources, and wherein the processor is configured, by executable instructions stored in memory; to:
receive sensor data from one or more of the plurality of sensors;
using the sensor data, associate one or more individual interaction units of the plurality of interaction units with a corresponding interaction unit type in accordance with the stored definitions of interaction unit types;
generate feedback for each individual interaction unit from the plurality of interaction units,

wherein the feedback is based on the type of the individual interaction unit;
store a sequence of the interaction unit types of the plurality of interaction units; and
generating a descriptor of the sequence, wherein the descriptor is based at least on contextual information derived, at least in part, from the sensor data.

These methods combine the following methods to extract the moments of the unconscious mind reflected in the string of Empathemes (i.e., the sequence of interaction units with the empathetic computing device, the Enryō app). For any practice, a calm, quiet environment is highly relevant. The Enryo Learning Experience reflects those calm moments using the context information, such as the sound surrounding the practitioner, along with the stillness of the initial action.

(iii) Stillness detection
Background: various types of conventional computer interfaces typically require the user's specific attention to the task to explicitly control the machine, which may be disruptive, cumbersome, or annoying for the user. Thus, user interfaces that enable interaction with an electronic apparatus more naturally and implicitly may be desirable.

A method of interfacing with a user, comprising:
detecting a user in proximity of an apparatus;
entering a first stillness detection mode of the apparatus from a standby mode of the apparatus responsive to detection of the user in proximity;
detecting initial movement of the apparatus;
for a period of time following the initial movement, receiving motion data from one or more sensors of the apparatus responsive to the initial movement of the apparatus;
processing the motion data to detect lack of movement of the apparatus following the initial movement;
entering a second stillness detection mode responsive to the detected lack of movement; and
providing a response with the apparatus during the second stillness detection mode.

The innovative concept with concrete technical development lies in the philosophy of technology. The system functions alongside the natural human bodily actions in the form of practicing, and the system produces a sequence of Empathemes or a sequence

of interaction units based on those successive actions. In other words, both the human and the computer (the Enryō app) work together in harmony.[22] The algorithm of the state transition matches the practitioner's act of practicing.

The sequence of interaction units is only created by the natural actions that turn into unique and useful data that both humans and computers (i.e., the Empatheme system) can use. The Empathemes created through human actions interact with the Enryō app and generate meaningful patterns for learning, self-reflection, and self-exploration, as well as allowing for empathic communication among the practitioners.

Whether it is conscious or unconscious, human actions reflect the conditions of the environment and vice versa. The methods to measure the conditions and count them deliver useful information as long as those phenomena happen in a way that is not disturbed by the conscious mind. The Enryo Learning Experience realizes such an environment. The technology works with the philosophy when it is put into practice accompanied by bodily actions.

Before this implementation of the Enryo Learning Experience project, Empatheme Foundation collaborated with the Department of Biomedical Engineering at Toyo University with a total of 240 students to conduct an experimental curriculum based on the Empatheme system.[23] Also, a total of 200 individuals around the world used the Empatheme to experience it over the last two years.

2.4 Development of the Smartphone Enryō App

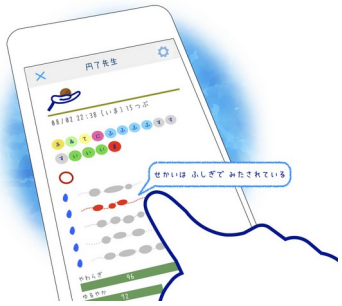
To demonstrate and provide a real user experience, the Japanese language app, called *Enryō Enro* 円了えんろ, which is based on the Empatheme system, was developed as a downloadable app on iOS (for iPhones and iPads) from the App Store of Apple, Inc. and on Android OS from the Google Play Store.

22 The word Empatheme is a neologism. It mirrors the philosophy of Enryō, which sees nature as interacting with empathic communication. Empatheme is a unit of empathy through the interactive process to become a vehicle that inspires human imagination and thus further empathic communication among those that share the feeling of empathy. For more detail, see https://ja.empatheme.org and the collection of writings based on philosophy and scientific research to help practicing mind.

23 YOSHIDA Yoshikazu 吉田善一, SAKAGUCHI Rikkō 坂口立考, et al.「人工知能技術者教育を目指した学生実験の開発：AI に正しく対峙するための倫理観を高めるトレーニングプログラム」[Development of an undergraduate laboratory course for artificial intelligence engineers: training program for maintaining high ethical standards for coping with AI],『工学教育研究講演会講演論文集 2018』[Proceedings of annual conference of Japanese Society for Engineering Education 2018] (2018): 514–515.

The Empatheme system works not only in the Japanese environment but also in various countries. Now that the first Enryo Learning Experience app has been made available, in the future the same experience in English or other languages can take advantage of the existing model. It is unnecessary to develop new apps (i.e., developing new software, maintaining updates, and running service for every single app). All that will be needed is the voice content in English or another languages provided by a volunteer. Depending on volunteers and donations, the Enryo Learning Experience in English will be provided soon.

1 Read the visualized words of Enryō.
2 Listen to the vocalized words of Enryō (Fig. 2).
3 Speak the words of Enryō in one's own voice.
4 Listen to the words of Enryō in one's own voice.
5 Write the words of Enryō with annotations and associations.
6 Chat with colleagues/teachers on words of Enryō.



(Fig. 2 Enryō app)

Conventional technologies can handle each requirement. However, as described in the previous section, the creation of an environment, where practitioners can vocalize the words of Enryō and reflect on them, is crucial. The Empatheme method guides the features in a seamless flow.

Sharing and interacting with others regarding Enryō's words also forms an essential part of the Enryo Learning Experience as the learning platform. The act of voicing, or the experience of repeatedly vocalizing, helps to internalize Enryō's words. Research in neuroscience, psychology, and linguistics documents the fact that the frequency and weight of output by vocalizing words has significant effects on mental development and learning.[24] The Enryo Learning Experience, with listening, speaking verbally, reflecting with visual representation, intuitive graphs, and memorizing them along with annotations, further drives consistent practice that lasts.

The master Enryō is literally in hand. Furthermore, accompanying communication among those in the same environment motivates practice.

24 Lisa Feldman BARRETT. *How Emotions Are Made: The Secret Life of the Brain* (Boston: Mariner Books, 2017); DAna SUSKIND. *Thirty Million Words: Building a Child's Brain* (New York: Dutton Books, 2013).

2.5 Development of the Enryō Content

The Inoue Enryō Research Center compiled and edited the selection of Enryō's words as *Enryō's 105 Essential Words*「円了金言集 105」to make original content for the Enryo Learning Experience using the Enryō app. The three aspects are (i) visual content, (ii) text content, and (iii) voice content. Each of the 105 selected passages of Enryō is visualized as a web-based article. It gives a feeling of Enryō's words of philosophy. It is always on hand, easy to read in one minute. One cannot underestimate the power of visual images attached to Enryō's words in a compact size. Well thought out readability for the day is vital. An article that is too long diminishes the motivation of practitioners, which is an unconscious reaction. Minimizing distractions and keeping the compact size reduces invisible barriers in the mind (Fig. 3).

(Fig. 3 Enryō contents example)

The audio recording of Enryō's 105 passages was conducted by one of the actual practitioners during practice using the Enryō app, rather than using ordinary recording equipment. In other words, all the words in real voice are made in the same way that the practitioners would do it. This allows practitioners to imaginatively think of Enryō, assuming Enryō himself would have practiced it in the same way that any practitioner practices on the Enryō app. The feeling of closeness, beyond 100 years, is inspiring.

2.6 Development of Tools to Run the Service

The Enryo Learning Experience is designed with the basic service in mind. The platform needs to administrate the practitioners' accounts and databases. The development of the management tool was the essential part. The Enryo Learning Experience is now a useful platform for future research, given that each practitioner produces their unique content and practicing data in the form of Empathemes, which include voice expressions, written phrases, and contextual information. Following the Enryo Learning Experience model, a communication service with content sharing can be done by anyone using the Empatheme platform. For example, a school teacher can produce content with a group of students and then share these communications with more students.

3. Result

The Enryo Learning Experience was exhibited at the 8th International Conference of the Association for Inoue Enryō Research, in Tokyo, on September 5–6, 2019. A demonstration took place for the audience and for the association members on the first day, and for the general public who joined on the second day. Following the commemorative event for the Centenary of Death of Inoue Enryō, the Empatheme Foundation is continuously collaborating with the Department of Biomedical Engineering at Toyo University. Some students are working on the Enryo Learning Experience for their graduation research project.

3.1 Experience with the Enryō App

The following description outlines the typical experience flow of the Enryo Learning Experience when practicing. Upon opening the Enryō app, the practitioner accesses the login screen from the opening screen. The Enryō app has four modes: (i) Guide, (ii) Interaction, (iii) Session, and (iv) Reflection.

(Fig. 4 Empagraph)

3.1.1 Interacting with Enryō (Fig. 4)

1 The practitioner connects to Enryō Empalletes (i.e., the words of Enryō in the handy format with visual content[25]) through the internet browser.
2 The practitioner finds Enryō's words in a short passage and reads through the various phrases.
3 The practitioner interacts with Enryō's words by viewing the vocalized expressions.
4 The practitioner listens to the voice of Enryō.
5 The practitioner writes a series of words on the voice content.

25 Visit https://ja.empatheme.org. The Empallet is an article in the size of the palm or the screen size of the smartphone. A text input, e.g. "円了," in the Empallet search box will provide a collection of small essays on Enryō. The Enryo Learning Experience, based on the Empatheme website, features the Empallet for savoring the philosophical words for practicing.

6 If the practitioner registered as a group, then they can interact with other colleagues and learn the teachings of Enryō together.

3.1.2 Creating Session (Fig. 5)

1 Throughout the entire session, the Enryō app (i.e., the smartphone) must be placed flat on a surface to function correctly. In this way, it guides the practitioners into a calm and quiet environment. If not placed, the session will purposely not start.

(Fig. 5 Session example)

2 The session begins automatically with the first yellow bead after waiting for a couple of seconds.
3 On the second light-green color bead, the practitioner slowly draws a complete circle by tracing the outline of the bead to continue with the session. This simple act of drawing a circle, which is known as *ensō* 円相 in the Zen world, helps the practitioner to be calm, while the technology is measuring the surrounding state.[26]
4 Next, a light yellow bead will appear. The practitioner can vocalize Enryō's words.
5 By doing so, a pink bead appears, which is followed by a blue bead. If the practitioner keeps silent without vocalizing, a light grey bead will appear.
6 If the practitioner taps and holds the middle of the bead for a few seconds and releases, the bead will slowly turn green. Breathe calmly.
7 Lastly, draw another complete circle by tracing the outline of the bead. A red bead will then slowly appear.

The methods to create the session are characterized by four Cs: Clear, Calm, Continuous, and Constant; i.e., the four keywords that measure and describe the outcomes of the session. Empagraph displays these measurements for all sessions. "Clear" refers to the level of clearness or noiselessness of the surrounding environment. "Calm" refers to the level of calmness of action in drawing the *ensō*. "Continuous" indicates the level

26 The works of Thich Nhat HANH, e.g. *Being Peace* (Berkeley: Parallax Press, 2005), popularized the concept and promoted it globally.

of the duration of the session. "Constant" refers to the frequency of the session. As the origin of the word "session" means "an act or state of sitting," the Empatheme platform supports the quality of the session, doing it slowly, calmly, consistently, and daily.[27] Many pieces of research on human performance suggest the benefits of daily reflection and a ritual that nurtures a habit of doing so.[28]

3.1.3 Review Session (Fig. 6)

1 The practitioner's vocalized expressions and the various context of the session, such as the clearness of the user's surroundings and the calmness of the actions, are all reflected graphically.

2 Tapping the string of Empatheme allows practitioners to listen to their own vocalized expressions or leave annotations. This will enable the practitioner to constantly self-reflect and practice Enryō's words.

(Fig. 6 Reviewing example)

3 Through the four modes, the Enryō app becomes an environment to simultaneously learn to practice the act of self-reflection in the user's everyday life and learn Enryō's philosophy.

3.2 Experience by Enryō Content

Following Enryō's inspirations, the original pictures of nature taken at the Temple Garden of Philosophy are used to enhance the affinity to Enryō's philosophy.[29] As Enryō reiterated, the wonder of the universe and inspiration from nature is the source of human imagination. The stars, the mountains, and the rivers—all are teachers.[30] Likewise,

27 Thomas M. STERNER. *The Practicing Mind: Developing Focus and Discipline in Your Life* (Delaware: New World Library, 2006) suggests four Ss for practicing mind: simple, small, short, and slow. Slowness is the most difficult to achieve. Patented methods are used in the Enryo Learning Experience to facilitate slowness.

28 Jim LOEHR and Tony SCHWARTZ. *The Power of Full Engagement: Managing Energy, Not Time, Is the Key to High Performance and Personal Renewal* (New York: Free Press, 2003), p. 110. Marcus AURELIUS and Blaise PASCAL are also examples of the numerous people that stress the wisdom of meditation.

29 See appendices for the graphical representations.

30 The Japanese text reads:「星辰も教師なり。山川も教師なり」. See Inoue Enryo Research Center 井上円了

the Enryō app is an environment in the hands where an analogy of a plant reflects the small effort of nurturing daily practice. For example, in the Empagraph, sowing the seeds, watering the sprout, and nourishing the ground is analogous to the act of learning by doing. The root, the leaf, the flower, and the fruit represent continuous effort.[31] Practitioners on the Enryō app can produce their own art form and continuously create an atmosphere to give invisible power.

3.3 Feedback

The initial feedback that the Enryo Learning Experience got from the audience highlights the practical ways to promote Enryō. There is easy access to the content of Enryō in a concise manner, accompanied by the voice content of Enryō. Some members expressed that, compared with all the feats that Enryō accomplished and the precious legacy he left for people today, Enryō is still not well known and not accessible enough to the general public to the level he deserves. The Enryo Learning Experience is one of the attempts to assume the task of promoting Enryō more widely. As one of the most popular technology tools in the world, applied in the way that the Enryo Learning Experience demonstrates, the smartphone app is a viable method for this purpose.

Other feedback on the Enryo Learning Experience goes beyond learning and internalizing the philosophical teachings with Enryō's words. The method suggests a similar type of application in learning. For example, other words of wisdom can take the place of Enryō's words, if they are made available in the same manner. The platform of the Enryo Learning Experience is capable of delivering the visual and written content along with the audio and voice content. As the Confucian adage holds, "Read aloud a hundred times over, and the meaning will become clear of itself."[32] The Enryo Learning Experience offers far-reaching features to extend this proven method.[33] Words of wisdom abound, and so many quotes are available on the internet today, but practicing them is not a shared concept. Despite research that shows the clear benefits of reading

研センター, ed.「円了金言集105」[Enryō's 105 essential words].

31 See appendices for the graphical representations. Also, see https://ja.empatheme.org/emp-0040.

32 In Chinese,「読書百徧而義自見」from『三国志』[Records of the three kingdoms],「魏志」[Annals of Wèi], fasc. 30.

33 KOBAYASHI Hideo 小林秀雄 and OKA Kiyoshi 岡潔「人間の建設」[Human development] Tokyo: 新潮社, 1967; TOYAMA Shigehiko 外山滋比古.「忘却の効用」[The utility of oblivion] (Tokyo, 筑摩書房, 2009), p.150.

aloud to learn and the fact that such practices are prevalent across many countries—particularly at the early stages of education—the practice of self-learning with voice is underused.[34]

4. Discussion

While the Enryo Learning Experience was made available as a working platform based on the Empatheme technology adapted for learning Enryō's philosophy, it presents unprecedented opportunities for useful applications to help people realize their potential. Moreover, it suggests unique opportunities for a wide range of scientific research that was never possible before Empatheme.

4.1 Application Opportunities for Learning with Voice

Voice-related technologies such as telephony and recording have a long history. Speech recognition has become a built-in application for smartphones. Nevertheless, the effective use of the human voice has yet unrealized potential.[35] The Enryo Learning Experience specifically uses unitized pieces of speech in a phrase as the medium of self-learning as well as communication. Empatheme is an extraction of the moment in small pieces, which have a duration time of a breath or two of a person (i.e., roughly 4 to 10 seconds). Within Empatheme, the voiced speech is a piece of a few seconds, a countable and measurable small piece of data. At the same time, it is a visualized medium. Using the same manner as the Enryo Learning Experience, a different type of voice content will allow new practical applications.

4.1.1 Second Language Acquisition (Practicing)

Foreign language learning or second language acquisition can use precisely the same method for practicing (listening, speaking, writing, reading, sharing) by combining the output and the input. Typical English lessons, for example, involve phrase repeating of native speech. Voice content, based on a small piece, enables a measurable exercise, phrase-by-phrase specific tutoring, and support. It has not been possible due to the lack of such a technical method used for the Enryo Learning Experience.

34 Jim TRELEASE. *The Read-Aloud Handbook*, 7th ed. (New York: Penguin Books, 2013).
35 See the example of Empatheme patent describing a hybrid labeling system.

4.1.2 Reading Aloud for Family Communication (Learning and Sharing)

In addition to the benefits of reading aloud for learning, there is another aspect of using voice in daily practice. Reading aloud together between a child and a parent enhances communication. The Enryo Learning Experience applied to read aloud a picture book, for example, will create an environment that fosters a child's learning and emotional sharing between them. The platform records the experience word by word, based on the Empatheme methods, and memorializes the practices. It provides opportunities to turn the impact of the excessive use of a smartphone for a young child the other way around.[36] In this scenario, teachers are supporters alongside the parents and can join together to form a small community for learning.

4.2 Application Opportunities for Communication within Communities (Sharing and Caring)

Practicing is not limited to learning, training, exercising, and studying. The simple act of breathing or vocalizing a word can provide new opportunities for communication. The Enryo Learning Experience can become a sharing and caring platform. For example, for an older adult at home who needs care and support, the simple daily practice of leaving just a word or even a breath will provide useful information to those caring for them. A small daily practice will result in efficient health conditioning as well as preventive measures, nursing, and caretaking for those in need of support. It allows a cost-effective way of providing communities with a method of helping people.[37] The benefit of such a system that provides a remote service by using a smartphone will complement the costly health care system. The idea fits Enryō's philosophy of serving people.

4.3 Scientific Research Opportunities Using Unique Data

The Enryo Learning Experience based on Empatheme methods has a quantitative measurement of the practicing process of an individual. Scientific research can benefit from the collection of information about the self when focused on practicing in the same environment daily.

36 The following work discusses the influence on young children using digital devices: Michael BITTMAN, Leonie RUTHERFORD, et al. "Digital Natives? New and Old Media and Children's Outcomes," *Australian Journal of Education* 55, no. 2 (2011): 161–175.

37 Compared to video data, which occupies by far the largest portion of internet traffic, simple text data and the voice expression for a few seconds, used for the Enryo Learning Experience is extremely small, roughly less than 1/10 of video data.

The background of this thought is evident in today's technology-led world. More and more global businesses promote their products and services using advanced computer technologies, such as deep learning or AI, to offer analysis-based convenience and usefulness. They process vast information covering a wide range of areas of human activities. The conventional approach has been to generalize human behavior in order to capture it objectively and produce data to analyze. Despite its usefulness, there is a blind spot. Conventional methods do not capture the subtle information unique to the individuals in a way that they can intuitively reflect with the information. They miss information like moments of natural behaviors such as breath, tone of voice, movement of hands, and posture because there is no specific method to capture them without distracting the mind of the user (i.e., the practitioner of daily life). Various factors produce effects. Today's computing requires an explicit method of giving an input or a command through the interface to manipulate the device. Conventional methods do not solve the problems of capturing the information taken without the user's knowledge that affects the user's emotions. As opposed to the massive capability of computing today, such small information has been the missing link.

The Empatheme method captures information unique to the practitioners in real time, providing a standard format to use in ordinary daily life. Once the information is captured and visualized intuitively, it works as a vehicle or a medium that enhances communication. The quantitative measurement of natural action that arises in the unconscious mind, such as feeling, imagining, empathizing, and reflection in the moment, provides new opportunities for a wide range of research. For example, the information about the self, collectively gathered, is useful in the area of AI and robotics, psychology, neuroscience, clinical medicine, and education, as well as training, counseling, and mental health areas. While the Enryo Learning Experience demonstrates empathic communication among the practitioners, it can provide many new ideas for tools and applications to help the real working place.[38]

38 YOSHIDA Yoshikazu 吉田善一, ISHIKAWA Hidenori 石川英憲, and SAKAGUCHI Rikkō 坂口立考.「無意識的な活動：視座に対する気づきを誘発する学生実習プログラム開発」[Development of an undergraduate laboratory program for inducing awareness of unconscious mind for engineering ethics],『工学教育』[Engineering education] 69 (forthcoming in 2021).

5. Conclusion

Following Enryō's endeavors to serve people until the very last moment of his devoted life, the Enryo Learning Experience seeks to inspire hope by innovating in how we create an environment, a community, and a philosophy for learning to serve people.[39] Such a collaborative initiative between people in different fields, i.e., philosophy and technology, led to the Enryo Learning Experience.

Through its realization, the Enryo Learning Experience brought philosophy into the development, the creation, and the act of practicing. It goes beyond an interpretation of the philosophical works of Enryō and uses them to direct the technical platform, tools, and applications. Much more importantly, it is an unprecedented attempt to innovate ways to imagine, to think, and to practice in ordinary life, which serves as a viable model with new methods with examples for future research. In summary, the Enryo Learning Experience presented:

1 A new opportunity for the promotion of Enryō and his philosophy to a broader audience in the world.
2 A new model of learning methods and of internalizing the teaching.
3 A real learning environment based on technology innovation.
4 A method to realize the potential of innate human abilities, such as voice and the unconscious mind.
5 A unique proposition on future opportunities for research through new types of data and information about the self.

The Enryo Learning Experience has its foundation in Enryō's philosophy. It means that not only is the understanding of his accomplishments and works in the context of the world a hundred years back important, but also that is recaptured in the context of the contemporary world. If Enryō were present with us today, his philosophy would drive thought and action to serve today's world. In this respect, point 5 mentioned above is essential to integrating the real significance of the Enryo Learning Experience. Technology innovation needs the direction of philosophy. Philosophy needs to assume an

39 MIURA Setsuo 三浦節夫.『井上円了：日本近代の先駆者の生涯と思想』[Inoue Enryō: the life and thought of a pioneer of Japanese modernity] (Tokyo: 教育評論社, 2016). Enryō died right after having a stroke during a lecture. He disclosed his will to the public.

essential role in technology. Thus, the Enryo Learning Experience shows unique and viable examples of how philosophy inspires technology innovation and how technology innovation inspires philosophy.[40]

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40 One concrete example based on the Enryo Learning Experience is "Ei Pra" (英プラ), which can be accessed at the following in Japanese: https://ja.empatheme.org/english-practice; and, in English at the following: https://en.empatheme.org/english-practice. The following pages provide an easy to read summary of 英プラ: https://ja.empatheme.org/emp-0280-5 and https://ja.empatheme.org/emp-0280-6. Again, this is a realization of the Enryo Learning Experience, based on the same model, method, and platform applied to educational/learning purposes, supported and enhanced by scientific research.

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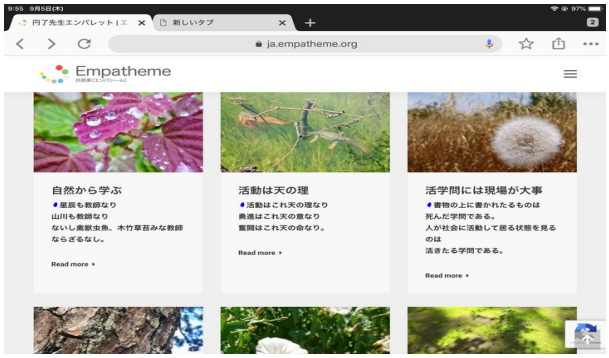
Appendices

(1) The Enryo Learning Experience Website



(2) The Enryo Learning Experience Poster