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Editor's Preface to the New International Journal

On the behalf of the editorial board, I am pleased to announce a new separate volume of DHU Journal, DHU International Journal. The aim of this open-access international journal is to provide opportunities for researchers, practitioners, and students in digital content and communication to publish their work and achieve global exposure.

This inaugural volume comprises three peer-reviewed articles: Matsumura et al.' s "Relationships between Success Skills for Young Professionals and Competency Enhancement in University Education: from the Perspective of PROG Test Measurements" presents the results of their analytical study on relationships between the work competency required for Industry 5.0 and university education; Maeda' s research report, "The Ethics of Information "The Normative Theory in the Infosphere"" explores the formation of social norms and the construction of their foundations in the infosphere, examining the significance of information platforms to improve quality of life; and Kannari and Yamazaki' s "Comprehensive Survey of Requisites and Trends of Language Training in the COVID-19 Era" presents the results of their survey on the AI/Web services used in the commercial sector, demonstrating the increasing significance of AI in language services.

The first issue of DHU International Journal is a small-scale publication. Our vision, however, is that the journal will become an international outlet for presenting and exchanging new findings and ideas, developments, and achievements in areas related to digital content, digital communication, and education, contributing to their development. We encourage submissions from all scholars engaged in these areas.

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Contents

Paper

Relationships between Success Skills for Young Professionals and Competency Enhancement in University Education: from the Perspective of PROG Test Measurements

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Job satisfaction, career autonomy, and self-learning are important for young professionals to have a successful career. To analyze relationships among these factors in their professional life and university education, we surveyed 1,548 respondents who graduated between 2013 and 2016 from 13 universities in Japan. All respondents had taken the PROG test, which measures generic skills from two aspects, literacy and competency, in their third year of university. Their answers regarding career awareness, learning, and activities at university were analyzed in relation to their PROG test scores. PROG literacy scores during university did not correlate with post-graduate job performance, but a higher PROG competency score led to higher job satisfaction and motivation. The respondents' self-evaluations showed that their enthusiasm for coursework and activities and their proactive experiences and sense of growth while in university positively related to the attainment levels of literacy, competency, and subject mastery. These analysis results suggest that learning and activities during university to increase competency can increase young professionals' job satisfaction and career autonomy, which are important in managing transformations in job requirements and concepts regarding Industry 4.0 and Industry 5.0. jobs.

1. Introduction

The Fourth Industrial Revolution (Industry 4.0), driven by digitalization and automation technologies, is transforming job requirements and concepts [1][2]. The Fifth Industrial Revolution (Industry 5.0), proposed by the European Commission as a new concept to advance Industry 4.0 innovations, is predicted to further transform the jobs and skill profiles of workers [3]. These transformations due to Industry 4.0 and Industry 5.0 involve substantial changes in the demand for knowledge and skills and indispensable implications for higher education. Many studies have demonstrated a growing gap between higher education systems and the future needs and demands of the labor market due to rapid technological advances [4][5][6]. Moreover, many students are expected to prepare for newly emerged occupations or positions of the future. Under these circumstances, many higher educational institutions have realized the need to reform the present traditional education system to manage the growing gap between academia and the needs and demands of the labor market.

Because of Industry 4.0 and Industry 5.0, educational programs and curriculums must evolve such that students can enhance their ability to apply, analyze, and create with what they learn in classrooms. In other words, the abilities acquired in university education should be more than memorizing and understanding a curriculum subject. Thus, many universities, as part of their educational goals, are striving to cultivate students' abilities to think logically and utilize knowledge to solve problems practically and enhance their behavioral characteristics while interacting in authentic environments [6]. However, attaining and assessing these educational outcomes is difficult. Although providing educational programs linked to positive career development is a role of university education, few studies have quantitatively investigated university education outcomes in terms of how they affect students' career development after graduation [7].

2. The Purpose of This Study

In improving the quality of university education, the visualization of learning outcomes is required, and each university is endeavoring to quantify or visualize these outcomes through various innovations. There are multifaceted approaches to the visualization of learning outcomes, but the most important aspect is to apply a long-term perspective regarding the effects of education to determine how university education is useful after graduation. In this sense, clarifying how the university education that young professionals receive affects their careers after graduation is crucial. Also valuable is identifying the connection between their university education and career development factors such as job satisfaction and career autonomy.

Thus, we conducted a nationwide survey targeting university graduates with some work experience 3–5 years after graduation. We analyzed the situation of graduates in terms of their satisfaction with their student life at university, the skills and abilities they acquired while at university, and their current professional life. We also analyzed the survey

data to determine how their competencies and skills had been cultivated at universities, directly and indirectly, and the influence of career development factors (e.g., self-evaluation on job performance and job satisfaction), which are essential to career success. In the analysis, we used survey respondents' scores on the PROG test in their third year of university to quantitatively investigate the relationship between their skills and abilities acquired from university education and the career development factors. We used their third-year test scores because many universities have them take the PROG test to demonstrate their levels of generic skills before job-seeking activities in their fourth year.

3. PROG Test

The PROG test is designed to measure the student' s level of the generic skills and attitudes required in society (hereafter, generic skills) regardless of major or specialization. It is a two-part assessment of the student' s generic skills: literacy and competency. Literacy is the ability to solve problems based on knowledge. Competency is a behavioral trait acquired through experience. The literacy part measures the student' s ability to apply knowledge and to continue learning. The competency part measures the student' s behavioral traits acquired through experience and the ability to transfer the acquired skills to any job. Tables 1 and 2 show the list of abilities measured by the literacy and competency parts of the PROG test, respectively [8].

Table 1. PROG test for literacy: skills measured

Literacy: Thinking skills required for the problem-solving process	
Skill Components	Definition
Information-gathering skills	Ability to identify appropriate information sources from a wide range of perspectives, collect and research information using appropriate means, and organize and store this information appropriately
Information analysis skills	Ability to organize and analyze facts and information objectively and from multiple perspectives, not based on assumptions or speculation, and to understand the hidden structure that integrates these facts and information to determine the true nature of the information. (includes verbal and non-verbal processing skills)
Problem-identifying skills	Ability to perceive phenomena and events from various angles and perspectives, consider the mechanisms and causes hidden in the background, and discover issues that need to be resolved
Conception ability	Ability to conceptualize the process of problem-solving while considering various conditions and constraints and to envision the risks and measures that might be implemented in the process

The PROG test objectively scores students' literacy and competency levels, and its measurement validity has been demonstrated in statistical analyses of a large volume of data. Many of the literacy and competency measurement tools involve subjective assessments conducted by test examiners and evaluators; therefore, their validities can be weak. To prevent subjectivity and validity problems in literacy and competency measurements, the PROG test has one question with no apparent correct answer. In its original questions based on realistic scenarios, the PROG test instructs the test-taker to seek optimal solutions for the scenarios and measures the test-taker' s ability to think logically and practically to solve problems by utilizing experience and knowledge, not simply confirming knowledge. Collected data from young leaders employed globally are used as a reference to evaluate student' s answers. This database, the model of judgment criteria and behavior they have selected for each question, is used to determine how statistically different students' answers are from the model, and the differences are transformed into the literacy and competency levels of the student [8].

Table 2. PROG test for competency: three skills measured

Competency skill 1: Interpersonal basic skills (ability to build trust with others and participate in a team)	
Skill Components	Definition
Affinity	Ability to take an interest in people and to empathize with and trust them
Cooperative ability	Ability to understand roles and help each other
Leadership	Ability to advocate opinions and enhance the team
Competency skill 2: Self-control basic skills (ability to control emotions and motivation)	
Skill Components	Definition
Emotional control	Ability to control emotions appropriately
Confidence-building ability	Ability to know the self and inspire confidence
Action persistence	Ability to work proactively and complete tasks
Competency skill 3: Basic skills for managing problems (ability to think and act to solve problems)	
Skill Components	Definition
Problem-finding ability	Ability to gather information and understand the essence
Planning ability	Ability to set goals and make plans
Practical ability	Ability to put thoughts into action and reflect

Because of the PROG test' s objective measurements of literacy and competency, as well as its advantage in qualitatively visualizing the outcomes of educational programs, many higher educational institutions in Japan have adopted it. Since 2012, more than 1.29 million students from universities and junior colleges have taken the PROG. From 2012 to September 2021, including technical colleges, vocational schools, and companies, 1.41 million PROG tests have been taken [9].

4. Survey Method

We conducted an internet-based survey from April 21, 2020, to February 22, 2021. A survey participation request was sent to 12,844 working adults who took the PROG test in their third year of university: 13.0% (1,548 working adults) answered the questionnaire. The details of the respondents, including gender, the year of university graduation, and their majors, are in 4.1. The details of the questionnaire are in 4.2.

4.1 Questionnaire respondents

The working adults had graduated between 2013 and 2016 from 13 universities nationwide: 779 males and 752 females (17 did not identify a gender). Table 3 summarizes the respondents' majors at university.

Table 3. Survey respondents' majors at university

Major	# of Respondents
Humanities or liberal arts	420
Social science	562
Science or engineering	366
Medical or health-related sciences	74
Other	126
Total	1548

4.2 Questionnaire items

The questionnaire had 11 categories. Categories 1–3 asked questions regarding basic attributes, such as age, gender, university major, years since graduation, and academic performance in the third year of junior high school and high school and at university graduation. Categories 4–8 asked questions about being university graduates. After extracting similar question items from survey questions used for many universities, we created our questions by focusing on the commonly observed items. The questions in categories 9 and 10 were from the Working Person Survey administered by Recruit Works Institute [10].

Categories 4–7 asked about experiences and satisfaction during university. Categories 8–9 asked about the respondent's jobs and careers, including questions about job satisfaction and career autonomy. Categories 11 and 12 asked about the abilities acquired in university and required in society. Question items regarding the respondents' experiences in university and their jobs and careers are summarized in Tables 4 and 5, respectively.

Table 4. Survey items regarding while in university

Category 4: Attitude and level of enthusiasm for coursework and activities while in university
Q1. Coursework in specialized subjects
Q2. Coursework in liberal arts subjects
Q3. Learning a foreign language
Q4. Graduation thesis
Q5. Club/circle activity
Q6. Part-time job
Q7. Job-seeking
Category 5: Learning experience and sense of growth while in university
Q1. Speak up in class
Q2. Didn't understand the classes
Q3. Discussed with other students
Q4. Participated in voluntary study groups
Q5. Felt closer to the faculty
Q6. Consulted with faculty and staff about my career
Q7. Had a sense of growth while in university
Category 6: Significance of the graduation thesis
Q1. General completion of specialized subject education
Q2. Experience in learning liberal arts
Q3. Discussions with various people
Q4. Communicate my view
Q5. Experience in task completion
Q6. Proactive learning attitude
Category 7: Satisfaction with subjects and activities while in university
Q1. Coursework in specialized subjects
Q2. Coursework in liberal arts subjects
Q3. Learning a foreign language
Q4. Graduation thesis
Q5. Teachers' teaching procedures
Q6. Club/circle activity
Q7. Friendships
Q8. Part-time job
Q9. Job-seeking
Q10. Total satisfaction

Table 5. Survey items: jobs and careers

Category 8: Jobs and careers 1
Q1. Career after graduation
Q2. Current employment status
Category 9: Jobs and careers 2
Q1. Type of industry
Q2. Type of occupation
Q3. The company' s scale
Q4. Type of industry
Category 10: Job satisfaction and career awareness
Q1. Learning activities outside the workplace
Q2. A sense of growth in the workplace
Q3. Sense of career prospects
Q4. Job motivation level
Q5. Job evaluation
Q6. Job satisfaction

In Category 11, we used 17indicators for the abilities acquired at university, and we requested a subjective evaluation (5-point scale), such as "To what extent do you think you acquired the following abilities at university?" Table 6 summarizes these 17 ability indicators, and they correspond to the categories of skills and abilities that the PROG test measures. In Category 12, the respondents were asked to indicate their perspectives on a 5-point scale regarding to what extent each ability in the 17 indicators is required in society.

Table 6. The 17 ability indicators of the survey for Categories 11 & 12

Q1. Affinity
Q2. Cooperative ability
Q3. Leadership
Q4. Emotional control
Q5. Confidence-building ability
Q6. Action persistence
Q7. Problem-finding ability
Q8. Planning ability
Q9. Practical ability
Q10. Specialized knowledge (Knowledge learned in specialized university courses)
Q11. General liberal arts background (Knowledge learned in college liberal arts courses)
Q12. Foreign language proficiency (Ability to use foreign languages)
Q13. Data science skills (Ability to think mathematically and analyze and utilize data)
Q14. Information-gathering skills
Q15. Information analysis skills
Q16. Problem-identifying skills
Q17. Conception ability

Note: Definitions of Q1–9 and Q14–17 are the same as those listed in Tables 1 & 2.

Factor analysis identified three factors for the 17 ability indicators, as shown in Table 7. The numbers in Table 7 indicate the strength of each indicator's influence on each indicator. Thus, a common latent factor is between indicators with large absolute values. Based on the factor analysis for each indicator, our interpretation is as follows: Factor 1, competency skill items; Factor 2, literacy skill items; and Factor 3, coursework attainment items. Therefore, using these 17 ability indicators to investigate the attainment levels for competency, literacy, and coursework was statistically reasonable.

Table 7. Literacy and competency skills acquired in college and their factors

17 ability indicators	Factor 1*	Factor 2**	Factor 3***
Q1. Affinity	**0.746**	– 0.123	0.071
Q2. Cooperative ability	**0.782**	-0.048	0.064
Q3. Leadership	**0.771**	– 0.002	– 0.052
Q4. Emotional control	**0.732**	– 0.051	– 0.020
Q5. Confidence-building ability	**0.919**	– 0.029	– 0.011
Q6. Action persistence	**0.806**	0.007	– 0.001
Q7. Problem-finding ability	**0.419**	0.402	0.004
Q8. Planning ability	**0.488**	0.343	0.002
Q9. Practical ability	**0.647**	0.167	0.004
Q10. Specialized knowledge	– 00.001	0.026	**0.387**
Q11. General liberal arts background	– 0.008	0.067	**0.810**
Q12. Foreign language proficiency	0.160	– 0.006	**0.397**
Q13. Data science skills	– 0.166	0.592	**0.165**
Q14. Information-gathering skills	– 0.032	**0.844**	0.071
Q15. Information analysis skills	– 0.051	**0.964**	– 0.021
Q16. Problem-identifying skills	0.038	**0.906**	– 0.070
Q17. Conception ability	0.107	**0.794**	– 0.165

* Factor 1: Competency (Q1-Q9)
** Factor 2: Literacy (Q11-Q13)
*** Factor 3: Coursework (Q10-Q17)

5. Survey Result and Analysis

The survey result was analyzed using the PROG test data of the respondents' tests in their third year of university. The main focus was the relationships between respondents' competency scores and career development factors. The scores of their self-evaluation for course subject attainments were also analyzed. Finally, we conducted a portfolio analysis of competency skill components in relation to needs and attainments reported by the respondents for the 17 ability indicators of the survey.

5.1 Relationship between competency scores and career development factors

The relationships between respondents' competency scores and career development factors were analyzed to determine how their PROG test competency and literacy scores in their third year of university and their attainment level of subject mastery affected their professional life after graduation. The relationships among career development factors were also analyzed. The path analysis results are illustrated in the diagram in Figure 1. The direction of an arrow in Figure 1 indicates a cause-and-effect relationship, and a number on the arrow shows a correlation coefficient between the cause and the effect, which indicates the degree of influence of the cause on the effect. Figure 1 demonstrates the multiple relationships, explained in the following paragraphs.

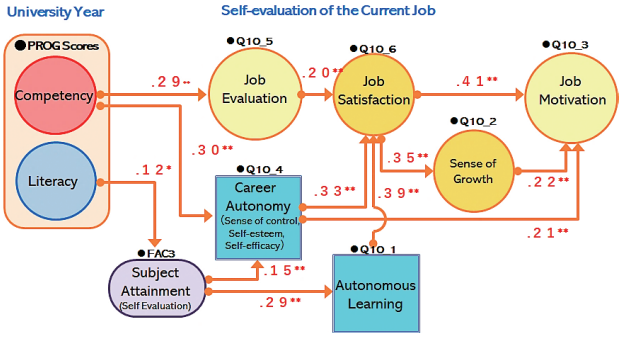

Figure 1. Diagram of relationships among the PROG scores, subject mastery self-evaluation, and career success factors (Note: Q10_#: corresponds to the question number of Category 10, and FAC3 denotes Factor 3 in Table 7.)

As shown in Figure 1, the competency scores of the PROG test during university years affected the self-evaluation of the current job and were related to career autonomy, an individual' s ability to manage their career and life. Moreover, the literacy scores of the PROG test did not directly affect the self-evaluation of current job performance but did affect young professionals' career autonomy and autonomous learning. The respondent' s self-assessment of the mastery level of a subject affected the self-evaluation of job satisfaction and job performance. For the relationships among career development factors, high job satisfaction was directly related to high job motivation, and high job evaluation led to high job satisfaction. In addition, the degree of job satisfaction was related to autonomy (career autonomy and autonomous learning) in the workplace, eventually leading to job motivation.

5.2 Relationship between PROG test scores and course subject attainments

Tables 8 and 9 show the relationships among the three attainment factors self-evaluated by the respondents (literacy, competency, and subject mastery), their attitudes toward activities and experience, and their sense of growth during their university years. Because the respondents' answers regarding attitude and a sense of growth were self-evaluations, we used self-evaluations for the three attainment factors. In Tables 8 and 9, the plus sign (+) and the minus sign (-) represent that an item in the left column ("Degree of enthusiasm" in Table 8 or "Experience and growth" column in Table 9) directly influenced the attainment factor (competency, literacy, or subject mastery) but that other items in the column did not. The plus sign denotes positive correlation, and the minus sign denotes a negative correlation. A blank in Tables 8 and 9 denotes that a correlation was observed but was mediated by other factors, and no direct relationship was recognized. The abbreviation ns means no correlation was observed between each item in the column and the attainment factor in the row.

Table 8 shows that the self-evaluation levels for the three attainment factors were related to the levels of enthusiasm for university activities, coursework in liberal arts and specialized fields, foreign language learning, and graduation theses. The attainment factors did not show a direct relationship with the enthusiasm levels for activities other than coursework, such as club activities and part-time jobs. We also analyzed the responses to the questions in Category 7 (satisfaction with university subjects and activities) to determine the relationships between the three attainment factors and respondents' satisfaction with club activities and part-time job experience. There was no direct relationship between the attainment factors and these activities.

Table 8. Correlation among three attainment factors (self-evaluation) and commitment and enthusiasm for activities while in university

	self-evaluated attainment factor		
Degree of enthusiasm	Competency	Literacy	Subject Mastery
Specialized subjects	+	+	+
Liberal arts subjects	+	+	+
Learning a foreign language	+	+	+
Graduation thesis	+	+	+
Club/circle activity			
Part-time job			ns
Job-seeking		ns	ns

As shown in Table 9, the three attainment factors were positively related to proactive experiences, such as speaking up in class, discussing with other students, participating in voluntary study groups, and building good relationships with faculty and staff. The table also shows that a sense of growth was directly related to the three abilities.

Table 9. Correlation among three attainment factors (self-evaluation) and university experiences and a sense of growth while in university

	self-evaluated attainment factor		
Experience and growth	Competency	Literacy	Subject mastery
Spoke in class	+	+	+
Didn't understand the classes	-	-	
Discussed with other students	+	+	+
Participated in voluntary study groups	+	+	+
Felt close to the faculty	+	+	+
Consulted with faculty and staff about my career	+	+	+
Had a sense of growth while in university	+	+	+

5.3 Generic skills for jobs

Figure 2 is a scatter diagram of the 17 indicators of abilities. For each indicator, the degree of attainment (self-evaluation) is on the horizontal axis, and the degree of need is on the vertical axis for each indicator. We classified the 17 indicators

into five groups: knowledge and skills related to university coursework, three competency skill areas (interpersonal basic skills, self-control basic skills, basic skills for managing problems), and problem-solving skills. Indicators in the same group tended to be close together in the diagram.

Based on the diagram, the analytical results are as follows:

1. The nine indicators, skill components measured by the competency part of the PROG test (Table 2), are in the upper right compartment. Because their values are above the average values of all the indicators for the necessity level for a working adult and the attainment level while in university, the respondents assessed that they acquired these generic skills necessary for working adults before graduation.

2. The respondents perceived that leadership, planning, and emotional control skills were relatively difficult to acquire during university; among these, the ability to control emotions, despite its high degree of necessity, was slightly below the average of the attainment levels.

3. The four literacy items, skill components measured by the literacy part of the PROG test (Table 1), are grouped near the intersection of the averages. Their necessity levels are not as high as their competency skill items, and their attainment levels while in university are slightly lower than the average value of all the indicators.

4. The four indicators for knowledge and skills related to university coursework are scattered and much lower than the competency and literacy items for the necessity and attainment levels. In particular, the indicator of foreign language skills is in a very low position for the necessity level for a working adult and the attainment level while in university.

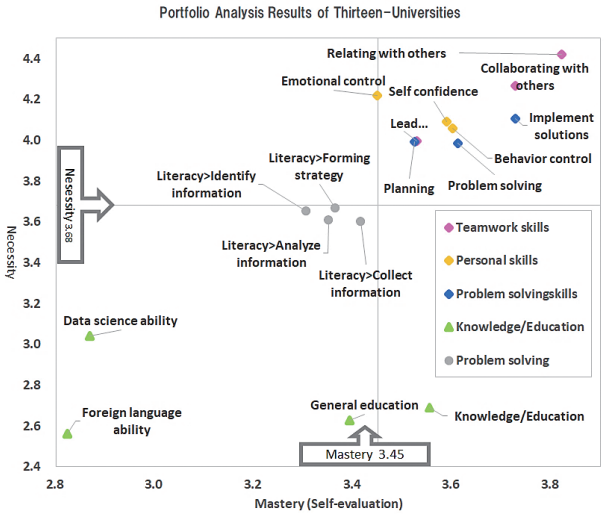

Figure 2. Portfolio analysis of competency skill components in relation to needs and attainments for the 17 ability indicators of the survey

6. Discussion

The effect of university education on generic skills and career development after graduation was not quantified because the outcomes of university education tended to focus on the aspects of coursework attainment, such as subject test scores and course grades. By expanding the scope of educational outcomes to include generic skills, we investigated connections between university education and professional life after graduation. The analysis results show that motivation is expected to influence performance in combination with ability. In other words, motivation coupled with ability is expected to influence performance outcomes.

Some studies have demonstrated that practical skills such as competencies are cultivated mainly by active learning in extracurricular activities and working experience during university [11][12][13]. However, our results show that cultivating these skills is possible but depends on how students engage in classes. The literature has demonstrated that extracurricular activities and part-time jobs positively contribute to skill development [11][12][13]. However, our results demonstrate that the content of these activities for a student is important. In other words, activity content that is valuable and meaningful to students induces their positive attitude and commitment toward the activity, including coursework, and eventually leads to successful career development.

The portfolio analysis of competency skill components in relation to the needs and attainment levels of 17 ability indicators shows that the university graduates perceived that they acquired higher skills in the competency components (Table 2) than in the literacy components (Table 1) and the proficiency acquired in class subjects. Moreover, the attainment level of emotional control was slightly below the average despite the high degree of need for emotional control. This indicates that the inability to manage stress might be a recent issue in university education. The levels of data science skills were recognized by the respondents despite necessity scoring higher than other skills acquired through course subjects in liberal arts and specialized subjects.

7. Conclusion

The employment environment of workers who recently graduated from university, typified by JOB-type employment, is undergoing major changes [9][13]. In this environment, university graduates must become professionally independent of organizations and companies, starting in their early working stage. In this sense, university students must develop various skills during their university years, which directly and indirectly influence their future careers. An analysis of PROG test scores from 2014 to 2020 of university students presented in The PROG White Paper 2021 [15] shows a downward trend in PROG test competency scores for self-control basic skills. Although basic interpersonal competency skills have remained mostly unchanged, competency skills such as leadership, emotional control, and planning have a declining trend. These skills are often mentioned as skills whose enhancement is expected more to manage recent changes in the job market.

The analysis results of this study reaffirm that student' s enthusiasm and proactive attitudes toward learning and activities while in university lead to career development after graduation. Positive attitudes toward coursework and outside class activities, including working part-time, can cultivate a sense of growth in the workplace, which can lead to job motivation. This implies the importance of a support system that encourages students to implement an independent and proactive approach to learning opportunities in class and outside class. The outcomes of university education should be considered from a perspective

of a student-centered support system for enhancing student's career development after graduation, as mentioned in [15]. Because of the increasingly severe employment environment due to the rapid changes in society and technology, universities are increasingly required to implement individualized support measures for each student to help them engage in learning and activities proactively and positively during university. Then, students' proactive behavior during their university years can enhance their ability to manage unprecedented changes due to the progress of globalization and accelerated advances in science and technology.

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The Normative Theory in the Infosphere

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This paper comprehensively examines the formation of social norms and the construction of their foundations in the Networked Reality (the infosphere), from the perspective of the metaphysics of information to the dimension of social implementation. The purpose of this study is, and the discussion begins with the ethics and metaphysical question of information as the starting point of what should be the better way of life and the place to live better in the infosphere. Referring to A.N. Whitehead's ideas of human civilization and social civilization in his "Philosophy of Organism", his paper uses the concept of the "cycle of good" model to identify ways to enable sustainable contributions to society and improve human knowledge to a high-definition "world resolution".

1. Introduction.

In this paper, the author clarifies the significance of information ethics in the networked reality (hereinafter referred to as the "infosphere") and consider what form and what role "learning to live a better life," which is the original purpose of ethics, can play in the contemporary infosphere. We will then discuss "what the infosphere should be," envision social norms for living a better life together with people living in the same infosphere and examine normative theories for their implementation.

First, for the sake of sharing the philosophy of social norms in the infosphere, I would like to introduce a part of philosopher Alan North Whitehead's worldview. At the age of 63, Whitehead took a break from writing the final volume of Principia Mathematica, which he co-authored with his close friend Bertrand Russell, and turned from mathematician to philosopher, working on metaphysics (philosophy of speculation), which was backward at the time. He also moved his education from Cambridge University in the U.K. to Harvard Business School in the U.S., which had just been founded. I would like to introduce a message that shows the reason why he pursued metaphysics while he was in a place to train business managers, and to show that his metaphysics is a practical study.

"Today, humanity is in one of its rare moods to change its way of looking at things. Our task - as philosophers, students, and businessmen - is to recreate and redefine a worldview that contains elements of reverence and order without It is to re-create and redefine a worldview that is thoroughly grounded in unyielding rationality. Such a worldview is the knowledge that Plato identified with virtue. [1]

Whitehead, who lost his youngest son Eric in World War I, believed that the new direction of human evolution was not civilization by "force" (war) as taught in Plato's "Timaeus"[2] 2300 years earlier, but by "agreement through negotiation and persuasion," or business. Furthermore, he had been working on not only mathematics but also early quantum theory, and his new goal was cosmology in the Greek philosophical sense. His dissatisfaction with cutting-edge physics and mathematics was the limitation of the "study of things," the inability to explain the "here and now" or "everything" in the world before our eyes with mathematical formulas. He conceived of the "philosophy of the organism" as a more concrete metaphysics and sought to question not only his students but the world at large about the worldview necessary for the impending turning point of civilization. The message came to fruition in 1929 with his main work, "Process and Reality"[3] in which he described the cosmology he wanted to open the world's eyes to. This cosmology was the path to a "better world (civilization)" that could be obtained by improving people's worldview (world resolution). In this essay, I would like to introduce the process of intersection between “A Virtuous of Cycle” model in the infosphere and Whitehead's "philosophy of organism".

2. Fundamentals of Information Ethics

Luciano Floridi, a scholar who has proposed the concept of the Infosphere and an authority on information ethics since computer ethics, is a scholar who addresses information ethics from a metaphysical perspective, positioning the Infosphere as "a new environment worthy of moral attention and capable of treating the people who inhabit it as an information organism in which to care for it, He positions it as an ethical framework"[4]. His ethical argument is an ontology that respects the life of the entire Infosphere equally, and he advocates an entropy-saving and deep ecological philosophy under the name of e-environmentalism.

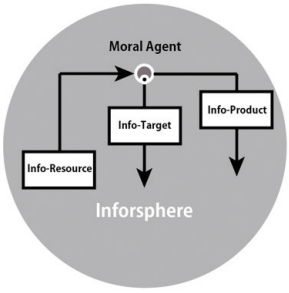

Figure1. RTP Model L.Floridi

The right figure (Figure1) is called the RTP model, which models the behavior of moral agents in the infosphere developed by Luciano Floridi. The circle in the left figure is the infosphere, and the moral agents (net users) in the sphere receive Info-Resource (R), define the target of their response as Info-Target (T), and output Info-Product (P) information. The beauty of this model is that it is easy to classify and analyze the patterns and factors of moral

reactions and immoral acts in the infosphere that occur in each of (R), (T), and (P). variation and applied it to actual online community interactions.

For example, applied to Floridi's image, the ethical object (T) and ethical behavior (P) of the moral actor depend on the ethical accuracy and quantity of information resources available to the moral agent, which in turn determines ethical judgment and responsibility. This corresponds to intellectualism according to Socrates' argument. However, I have made significant modifications to the RPT model because I believe that even if the accuracy and quantity of information available to a single moral agent due to the Internet is dramatically improved in Floridi's RTP model, it is not applicable to the circularity, database nature, and improvement of social norms as a knowledge community of multiple agents.

The figure on the right (Figure 2) shows multiple moral agents communicating in a bidirectional manner. This is the author's original model, which assumes that a particular moral agent performs a moral act with compassion, care, and affection for another moral agent. See Chapter 5.

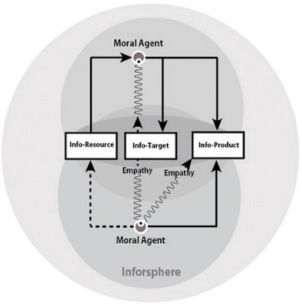

Figure2. Duolex RTP Model
MAEDA.Kunihiro

The figure on the right (Figure 3) illustrates an RTP model that incorporates time and vector elements in the individual infospheres. Interestingly, the moral agent will move both in time and space with bidirectional exchanges in the infosphere, thus broadening his or her human vision (here called the thought world or world resolution). **By Socratic logic, the more human vision and knowledge we expand the more morally correct decisions we will be able to make.** For further possibilities, see Chapter 7.

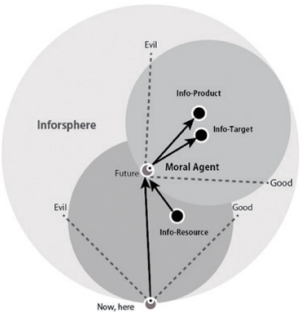

Figure3. Moral Life Log
with RTP Model
MAEDA.Kunihiro

However, since the infosphere has no map or center, it is almost entirely dependent on chance to determine where and how these interactions occur. This is because even though we are talking about an information society, we have not even accumulated half a century of history, culture, and customs as a society. Therefore, the public sphere (media effect) is finally created when an aggregation effect such as social media is generated with real human relationships as the starting point, and the starting point of individual interests is networked with other interests, becoming the center of multifaceted movement and its range of activities, in other words, the place where people stay the longest and communicate the most. Communities, groups, creative spaces, and exhibition spaces have become places where users interact with each other. Therefore, we would like to consider the value (=goodness) of the infosphere that such <places> possess.

3. Living in the infosphere

The Word is the house of being. In this abode man dwells.[5] "
It was Heidegger who said.

This term describes the process by which a human being is actively involved in the infosphere and eventually becomes an integral part of it. In the case of the infosphere, people do not buy a house for sale and live there. By transmitting useful information to others in a specific place and creating content that serves as a starting point for interaction, a home is created, and you live in that home. This is how the infosphere has developed. Therefore, words are not just words, but **content that invites the sympathy of others, in other words, the act of creatively spinning out words that create a home for oneself, opening and closing the door to find contact with others, leading to poetic human dwelling.**

One misuse of the word "home" that contributed to the development of the Internet is the name homepage. As the homepage within a website was introduced in magazines as the cover of the website, it was mistakenly thought to be synonymous with the website. Moreover, the meaning and value of "home" within the Internet must have been felt more attractive than that of "homepage" within personal website. What added even more value to the website was the domain name. It is a unique identifier in the sense that it is the only one of its kind in the world, and it is also valuable as an e-mail address. Initially they were just addresses attributed to countries or professions, but now they are brands. Do these now exist as poetically human "homes"?

Here again, borrowing from Heidegger's words, "We must begin by learning to live," I would like to consider the meaning of having a home in the infosphere and learn to "live" in it again. First, to live in the infosphere is to have a stable Internet connection, good human relations, no shortage of daily topics of conversation, hobbies, and places to study, and to maintain a sense of comfort in both the real world and virtual space at the same time. What is even more important is that it functions as a place for creative activities that nurture a person's identity, in other words, <living in a poetic way> is realized. In other words, depending on the individual, a place that does not ensure privacy due to insecurity, harassment from noisy neighbors, or noisy noise is not desirable. In the next chapter, the auther will consider what constitutes a good environment and a comfortable place in the infosphere.

4. Good and Circulation in the Infosphere

The auther believe that "goodness" in the infosphere is a state in which information that is meaningful or pleasant to one's life is flowing like clear air. Moreover, it is important that the information flows through the infosphere as food for life that can be shared by everyone and does not belong to anyone else. This can be compared to air in terms of its composition ratio, purity, and efficiency of oxygen and carbon dioxide exchange.

First of all, good air is free of dust and dirt, and that is how semiconductor manufacturing sites are chosen. The composition of the air, especially the ratio of oxygen (20.8%), is important to humans, and even the slightest change in this ratio can lead to illnesses such as altitude sickness and carbon monoxide poisoning and can even endanger lives. In

the same way, the content of the communication infrastructure can be compared to the stability of society: urgent messages, practical communication, entertainment and chatter, and malicious information such as fake news and scams. However, excessive bias can cause social chaos. The value of air and its limiting nature can also be better understood by counting the number of times it is used. We breathe 20,000 to 30,000 times a day and breathe air 700 to 800 million times in our lifetime. Similarly, the value of goodness in the infosphere can only be maintained through sustained breathing and smooth flow of information in the infosphere.

For example, Lao Tzu compares the highest good (summum bonum) to water in the phrase "the highest good is like water."

If the highest good could be compared to anything, it would be water. Water itself does not seek to benefit itself. On the contrary, it stays in the low places that everyone avoids, unobtrusively enriching all things and obeying the laws of nature. Satisfied with his place, quiet as a clear abyss, merciful to his friends, trusting in his word, and righteous in government, he will not seek to gain any profit for himself, but to enrich all things, and to follow the laws of nature. Work is done efficiently and time is not wasted. Great waters are in harmony with all things, there is no conflict, and no one is to be blamed. [6]

These words not only express how the properties of water represent the state of human virtue, but also make explicit that the ethics of the entire informational sphere is like water, or air. They are abundant before our eyes, but in a sense, they are invisible and transparent. The air (liveliness, security, cleanliness, etc.) that is indispensable to everyone, yet flows as a lubricant in the world for the benefit of the whole, and enriches the human body and mind, is the very social norm in the infosphere.

Now, to make this norm more <concrete>, I would like to calculate backwards from the amount of information that can be input to humans from the outside world to see how many decisions and how much time we have in our lives. To begin with, the amount of information that humans receive from the outside world through their sensory organs is said to be about 11 million bits per second, mainly images and sounds. However, the amount of information that reaches our consciousness through our nerves is only 126 bits per second, and the difference in information that we can perceive is limited to 1/18 of a second. In other words, within the limit of 126 bits per second and the resolution of active action of 1/18th of a second[7], the RTP model operates repeatedly, and human civilization (cultural creation) and human civilization are opened up. Compared to the abundance and permanence of air and water, how limited life is!

Man is placed in a world of his own, and as he limits himself, limited by it, he is in irreplaceable uniqueness. In each moment of limiting himself while being limited by it *- where man is in irreplaceable uniqueness with others - man is in face-to-face contact with God,* ***and these moments are passing into the next, and the world, in this moment-to-moment transition, is moving forward creatively and continuously toward so-called civilization through the medium of man's limited-immediate-perpetual-limited work."*** [8]

That is to say, within the constraints of this world, every event in our lives demands immediate moral judgment of us, forcing us to make decisions about our actions and the objects of right and wrong, and the number of such experiences may generate numerous virtuous or immoral events and mental ups and downs, depending on the person, creating a kind of wave in the infosphere, and creating a kind of harmonic or dissonant noise in concert with others. The number of experiences may generate several virtuous or vicious events and ups and downs of mental images and may generate a kind of wave in the infosphere, creating chords in harmony with others, or noise in dissonance. The characteristic feature of the social norm of information ethics that becomes clear here is that the individual infospheres are somehow connected, and through their interaction, this wave is transmitted, synthesized, amplified, or attenuated, and interrupts the "thought world" of the infosphere of others. In other words, there is as much noise in the home of the infosphere as in the real world, and its ups and downs include not only differences of opinion, but also moral differences, defamation, privacy, politics, religion, and all kinds of quarrels. A recent symbolic event is what is called "Selective News Avoidance". In short, the public's tolerance for viewing large amounts of depressing incidents, accidents, and unfortunate news is weakening. Alternatively, the scope of active information regulations can no longer keep up with the processing capacity of the information demanded, and this flood of information is no longer a good for the infosphere.

Information was originally created based on the workings of man's being placed in the world and becoming the focus of the world's self-forming action at each moment, in a way that is causally and materially limited and limits itself to an objectivistic concept." [9]

It is desirable to have "social norms in the infosphere" as an acceptable range of calm and stormy waves, musical chords, and noises. While there is a need for security information simply for self-preservation, for a better way of life, at the very least, it is the "peace" of humankind to have quiet in one's infosphere and to avoid needless ruffling of feathers. If most of the Internet's business is in the business of excessively demanding other people's attention and forcing useless information on them, then restructuring the media of the infosphere should be one of the most important priorities.

5. The Virtuous Cycle in "PatientLikeMe"

PatientsLikeMe(https://www.patientslikeme.com/) is a free service that combines real-name public social media with a collective knowledge database to share the nursing process of patients with incurable diseases and their caregivers and families.

In this advanced web service, the older brother Jamie (Moral Agent), a computer science student at MIT, took his younger brother Stephen (Target), who is suffering from ALS (Resource), out to the pool (Product), where Stephen, who is paralyzed from the head down, was The feeling of happiness felt by Stephen, who is paralyzed from the head down, can be recorded as data in the infosphere. The figure below shows the expression of negative emotions when the trial of lithium administration, which was expected to prolong ALS patients' lives, failed to show results. It is a community that does not impose itself on anyone.

Note that (Figure 4) is an extended and modified version of the RTP model to represent the emotional connection, which the auther refer to here as the "Virtuous Cycle" diagram. What is interesting about this system is that it is an interface and database that allows us to understand (empathize with) the patient's "right to self-determination" and "informed consent" regarding what kind of treatment to receive, as well as the patient's level of happiness regarding "treatment" and "care" that cannot be provided unless the doctor or nurse has a special feeling for them, not by numbers or their statistics, but with background information. The database is an interface and database that allows us to understand (empathize) with background information, rather than numbers and statistics. The auther envision building a system like "PatientsLikeMe" that facilitates the sharing of knowledge about caring for and caring for others, even without special expertise in the field. However, a new social media platform (a digital twin linked to the real world) is needed to address a number of social issues that are currently covering the world. The "smart city" is a non-physical smart city that aims to solve issues such as regional revitalization and the aging of society with fewer children, as well as a foundation model for a cross-disciplinary, specialized community.

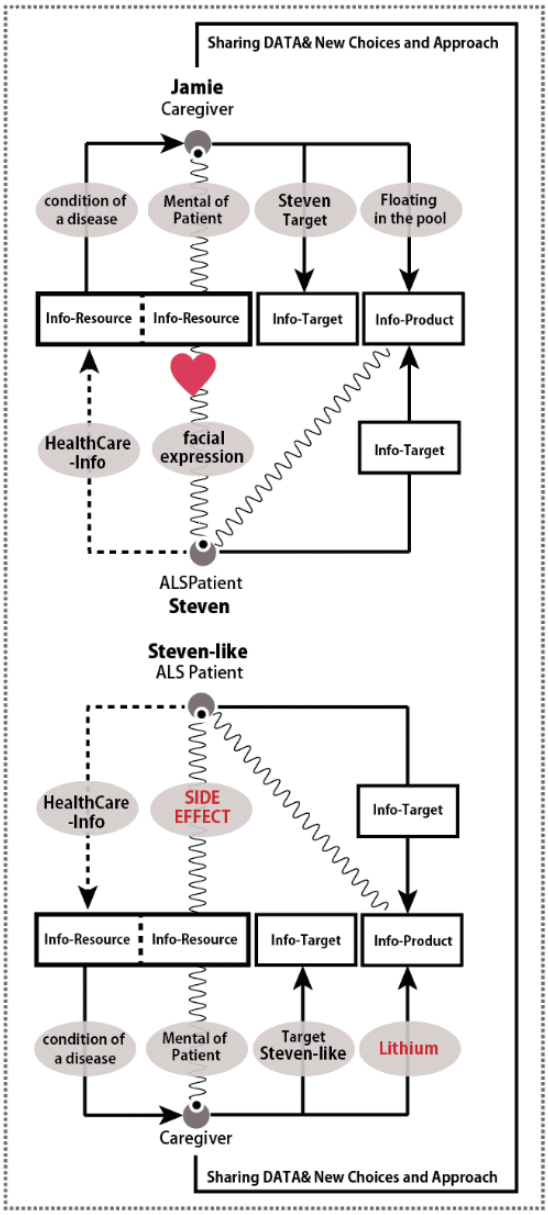

Figure4. Virtuous Cycle Diagram "PatientsLikeMe"

6. Implementation of Information Ethical Principled Knowledge

Altruistic algorithms are aimed at two directions of machine learning recommendation engines, i.e., organic (similar to the kindness and compassion with which moral human beings behave in the real world) rather than either partial or total optimization. Jamie invited Steven to the pool because he wanted to make Steven feel as if he were floating in the pool water of his own volition, as if he could no longer move his body from the neck down. This is one of those ideas that altruistic algorithms output, an idea of casual kindness and love that has been vetted for the benefit of others. But sometimes it works, and sometimes it doesn't; Steven may cry because he has bitter or sweet memories of the pool, or he may be devastated that his body will never be able to swim again. Therefore, let this case be a special success story. However, altruistic acts need not always be inspiring. Even a small act of consideration between friends or family members is an altruistic act, such as giving directions to someone who asks for directions or giving up your seat to an elderly person. The "altruistic algorithm" here is a mechanism of collective knowledge that provides Steven-like (another patient with a common background) with necessary information with much sympathy and empathy. What the auther is aiming for is a mechanism to share know-how, successes, failures, news, and other relevant information arising from cases of all kinds of social problems, as well as information that fits a specific target (persona) and background information (context). In addition, by linking with the community, the "altruistic algorithm" is not just a recommendation engine, but also combines human "reasoned" context and "empathetic information" and uses the algorithm as an adjunct to a recommendation engine by human hands in a way that was considered difficult in machine learning.

The algorithm is not complex but is based on the Socratic principle of (information-ethical) subjectivism, which states that the more information available, the more morally correct the decision. If humans can increase the accuracy of information through the multiple perspectives accumulated on the platform, and if they have creative perspectives while remaining confined to the limited world of what Whitehead calls "seeing with the eyes," the resolution of the world will become more precise, humans will acquire previously unseen information, and better social norms will be fostered. We can do this. I believe, as does Whitehead, that humans are capable of doing just that. In the next chapter, I will describe this concept and examine its versatility and availability.

7. Technology that raises the resolution of the world and fosters norms

The most distinctive research result of this paper is that the unidirectional nature of Floridi's RTP model is crossed with the sustainable circular community model and multi-layered, bringing it closer to the realization of a “virtuous cycle" with a multi-loop "world resolution" that goes beyond "seeing with the eyes" rather than subjectivity as an individual moral view The "virtuous cycle" is in the following.

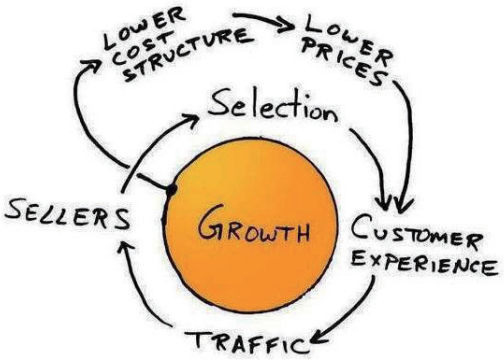

Figure5. Virtuous Cycle& FlyWheel
Amazon.com

Coincidentally, the Virtuous Cycle is the name of the famous business model of Amazon [10], one of the world's leading high-tech companies. However, its meaning is "the cycle of good (booming business)," not "the cycle of virtue. Nevertheless, the goods that are distributed are still the food of life, be it human virtue, food, or water, and if human are to make the Infosphere a better place, we should refer to the results of this highly efficient circulation model. The beauty of modeling lies in its availability, its scalability, and its ability to be tried and tested even when goals change.

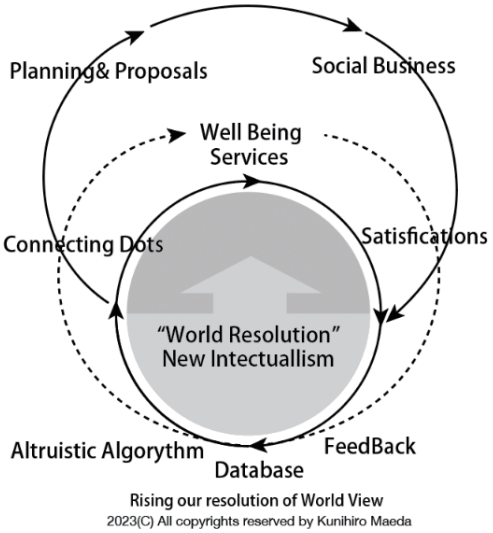

Figure6. Virtuous Cycle “World Resolution”
MAEDA,Kunihiro

For example, a young person about to become a parent for the first time will see a children's clothing brand or a toy store, even if he or she is walking down the same shopping street as the former you say and will see things from a perspective that did not catch his or her eye before, such as the height and stride of the child. This perspective will also look at children from a third-party perspective (poverty-stricken children in other countries or the world situation surrounding refugee children fleeing the ravages of war). This diversification of perspectives and expansion of horizons, which we refer to here as "world resolution," encourages people to connect their actions to the "ethical good".

Specifically, these abilities are refined with each experience, and by concentrating on specific knowledge in library and Internet searches, peripheral and specialized information becomes easier to see (and obtain). Furthermore, this ability is further refined through intellectual exchanges with third parties, which mutually enlighten and enlighten each other, and deepen the relationship of empathy and trust. These experiences, accompanied by various feelings and emotions, accumulate in the collective knowledge as the stories and know-how of a completely different third party. This is **the way to verify "truth (scientific and accurate knowledge, justice without prejudice or misunderstanding)" for what Whitehead calls "civilization," and only when a correct view of things is established can truth, goodness, and beauty be recognized.**

8. Normative Theory in the Infosphere

Earlier the auther mentioned that the ethos of the infosphere is like water and air. In the early days of the Internet, the spirit of autonomy, decentralization, and collaboration created serendipity and supported the foundation of the Internet. The spirit of open source played a role in smoothing the relationship of human ethics (altruism), as people took pleasure in knowledge and emergence that was useful to others in a shady way as their own. Today, however, the infosphere is dominated by the capitalist market, where previously free assets (users' public content) are used almost for free to train search engines and artificial intelligence, and

everyone (even judges) use those tools daily, even companies and services that are subject to monopolistic regulation. While not questioning here the legitimacy of its enormous revenues and market oligopoly, Hayek pointed out the imperfections of this digital capitalist market, defending the three shortcomings pointed out by David Hume "A Treatise of Human Nature", as follows.

(a) Individuals are different human values and beliefs of **limited toleration (Limited toleration), which** differ from person to person and society to society, and therefore, respect for individual diversity and a tolerant society are important elements that support a free market economy.

(b) **Imperfect knowledge and desires (Imperfect knowledge and desires)** also stated that people do not have perfect information about the market, making it difficult for them to make appropriate economic decisions, and that it is best to leave the decision-making to the spontaneous decisions of individuals with individual knowledge.

(c) **Scarcity of means to end,** He pointed out the need to assume that economic activities and decisions will always be subject to scarcity because of the constraints on the means and resources people must achieve their respective desires.

To resolve these issues, the economist Hayek, although a proponent of capitalism and liberalism, believed that economic theory could not solve these problems. He interpreted natural law in his own way, and from the perspective of social philosophy, he proposed a bottom-up legal order, which he called "autogenous order," to ensure equality and equity in society. Whitehead also offered harsh criticism of the evils of individual and social conventions.

I. Good people of narrow sympathies - A.N. Whitehead

Successful in certain fields, comfortable in a stable world, self-righteous with narrow sympathies, obsessed with self-preservation, intolerant, and extremely evil. [11]

II. Change with a great society, not a great man."- A.N. Whitehead

The harshness (poverty and inequality) of civilized society brought about by liberal beliefs requires, under democratic principles, mitigating measures such as welfare policies and social programs. The question then, which civilized society wants to address, is how to produce a great society, not how to produce a great people.

III. Cross-disciplinary collaboration and cross-interest communication - A.N. Whitehead

The challenge is to construct a worldview that includes "elements such as awe and order" and is "grounded in unyielding rationality" for various people with different specialties to collaborate and achieve a deeper level of communication that transcends their personal interests. [12]

And Whitehead gives only one example of an ethical means. **It is the need for "adventure. He says that it is ethical to die to self and live to others, and that it is the adventurous act of doing so for the sake of others that is ethical. This is** one of the five necessary elements of human "civilization," and it is here that the ethical good is realized. [13]

9. Natural law of the infosphere

Natural law, which has its roots in Greek philosophy and is separate from actual law, holds that the basic principles of morality and justice are inherent in nature, as in all other life, and that man can attain these laws through the power of his reason. It has been reinterpreted in modern times by many philosophers, including Grotius, Hobbes, Locke, Hume, and Kant.

Later, universal content was incorporated into constitutions, practical rules became substantive and customary law, and with the establishment of parliamentary democracy, the legal basis faded away, being transformed into a philosophy of law, natural law theory. However, The Natural Law suddenly made its presence felt at the Nuremberg Tribunal and at the Tokyo Trials as "Higher Law," where it became the basis for the establishment of "crimes against peace," "crimes against humanity," and "war crimes" by appealing to the past. In this sense, a "legal vacuum" regarding crimes of an unforeseen war scale would be a possible problem, especially in the infosphere (e.g., artificial intelligence weapons).

For example, the economist Frederick Hayek worked in later years to conceive and test the concept of an "autogenous order" based on his own interpretation of the Natural Law to protect democracy from corruption. This concept seems an ideal approach in that it is compatible with Internet culture, reforms the dysfunction of international law across the real law of nations, and democratically prevents the corruption of authority. Of course, we know that it has the same limitations as the United Nations, the Security Council, and international law, but could we not see the infosphere as a "Leviathan" and apply it to the control of specific cybercrimes that have significant common interests across political systems?

Hobbes' Leviathan attempts a modernized clarification of natural law, which dates back to Greek times and is separated from religion, with the most famous principle of self-preservation as its first section. Most of the content of natural law in only 11 chapters is also applicable to the right to the pursuit of happiness, which is guaranteed in international human rights law and other international laws and in the constitutions of various countries. Leviathan is described as an artificial state with strong authority, but what exactly it refers to is not noted by Hobbes. Because of its ambiguity, it was the subject of an inquisition by the kingly national church and condemned by parliament as a defense of absolute monarchy. Yet it is this multifaceted, intangible, and immense power that seems to be the new Leviathan, filling the legal vacuum in the informational sphere and making the rule of law a reality. It is also a milestone in the re-modernization of natural law that deserves to be the catalyst for a change in the status quo of international law, which is considered ineffective, because otherwise the legal order of the networked globe would admit

of a gradual regression by the decentralization of its authority. Specifically, private companies have recently been issuing unique IDs on the Internet by means of iris recognition. Basically, the purpose is to verify if a person is a real person or not through a camera when accessed remotely, but such a function could be converted into an oath or voting function for a strong artificial Leviathan in the infosphere. If the United Nations fails to reach consensus on a permanent Security Council, and if the relevant countries exercise their veto power, we will have a situation in which the nuclear powers will not be able to avoid war, and we will again be unable to avoid what Whitehead worried about a hundred years ago (the use of nuclear weapons, which Russell and Einstein blamed on the United States after the war). We will not be able to avoid again what Whitehead worried about a hundred years ago.

10. Conclusion: Toward the Realization of Social Norms in the Inforsphere

As we have already seen, Whitehead envisioned the realization of a dual structure in which man is placed in his own world by the "philosophy of organism" and creates newness in a way that limits himself while being limited by it, thereby acquiring "truth (scientific knowledge)," "art (the ability to express true beauty)," "ethics (ethical goodness = altruistic adventure)," and " He envisioned the realization of a dual structure that would produce new creations in the world in a limited, immediate, and capable manner. In other words, he dreamed of the civilization of mankind and the world through the cyclic re-creation of mankind and the world, which would evolve without the use of war. 100 years later, in the current international political climate, which once again looks like the eve of World War II, it is clear that the dream of the "world" is not only for scientists, but also for all people, **our task remains the same: "to re-create and redefine a worldview thoroughly grounded in unyielding rationality, containing elements of piety and order without which society would be in chaos."**

Whitehead equated these intellectual endeavors with what Plato calls virtue, but it would be difficult to make a modern person understand this scheme as Greek-era virtue ethics. Whitehead, moreover, called the smallest unit of entity (information), the basic premise of his understanding, Actual Entity, and sought a worldview in metaphysics that went beyond scientific explanation. Although it took 2,000 years to establish parliamentary democracy, we are now forced to imagine a new stage of humanity to avoid more misfortunes, to establish the habits of "co-creation, collaboration, and enjoyment" in addition to civilization through "persuasion," and to construct new international conventions and social norms in the transnational infosphere.

The auther believe that this concept can be implemented in society with the "Virtuous Cycle" concept to raise the "resolution of the world" in the infosphere. In the "PatientsLikeMe" case study, the options for treatment and nursing care are increasing. Automation will be dramatically increased in the future. And its promotion, says Whitehead, should be based on education, enlightenment, exchange, welfare, and its foundation by a great society, not a social vision by a great individual. It is the establishment of social platforms (socialization and knowledge exchange) in the true sense of the word.

It is important to note that as man is placed in his own world, and as he limits himself while being limited by it - where man is in irreplaceable uniqueness - man is constantly moving forward creatively in these moment-to-moment transitions. In other words, the limits of life are given as destiny, a creative opportunity for self-transformation and self-identity. [14]

In this sense, the worldview of artificial intelligence, which relates entities in the world in a <probabilistic statistical> manner, is incompatible with a metaphysical worldview that cannot be described by mathematical formulas, and with Actual Entity, which has a meaningful relationship with everything in the world. Therefore, the challenge of our time is not to realize the "good" as it is by advancing information technology, but to **"re-create and redefine the worldview"** by viewing the infosphere as a new world, and the reconstruction of a moral platform as a social norm should be given the highest priority.

In this paper, the auther have examined a model that supports the realization of human creative activity and ethical good by improving "world resolution" so as to climb one more step further and further up the civilization of humanity and the world that Whitehead aimed for. Given the many crises (i.e., apocalypse) that humanity is currently facing, it is imperative that the Infosphere become more ethical and build a shared social norm that transcends nation, race, and religion.

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This paper is based on the findings of a client with whom the author collaborated on the development of "Interest Space," a service conceived in Japan in 2001 and operated in collaboration with staff and users for the next 14 years as a pioneering example of social media. I would like to take this opportunity to express my gratitude to all parties involved.

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Comprehensive Survey of Requisites and Trends of Language Training in the COVID-19 Era

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This study examined the evolving need for language instruction in the commercial sector during the global pandemic. Having surveyed over 300 Japanese professionals, we discovered that 72.6% used AI/Web services to improve their language skills and 74.5% reported a significant decline in linguistic challenges. Notably, 60% of the respondents were satisfied with their current corporate language programs, but the majority expressed a desire to expand the programs for specific business-related language skills in their organizations. The results indicated a variation in the perceived importance of language training in specific skills based on age group. This finding highlighted the necessity of tailoring training programs to the specific skills required by different age groups, rather than offering generic training programs based solely on proficiency levels. This finding also emphasized the increasing significance of AI in language services and the critical need for advanced English communication skills in the business sector.

1. Introduction

The global pandemic has deeply affected work patterns and business communication. Traditionally, expatriates took time to build trusting relationships with their counterparts and functioned as hubs to bridge the gap between their domestic teams and overseas offices. For many companies, the number of visits and the time spent on entertainment are considered important. However, business cannot be suspended because of travel restrictions or difficulties with face-to-face communication due to the pandemic. The Japanese government's endorsement of remote work, bolstered by subsidies, has prompted companies to invest in online meeting technologies [1]. Previously, only a few employees had engaged in international projects. Currently, even new employees engage in remote meetings with global colleagues and clients [2]. This has shifted communication to digital platforms such as online meetings and email. This transition led to and necessitated the distribution of agendas and documents beforehand, thereby facilitating lucid communication. This transition challenges the earlier notions that, by working on-site, language barriers would naturally dissipate, and that showing Japanese hospitality and pairing communication with entertainment would be adequate.

For businesses with vast international operations, ceasing operations due to the pandemic is not workable. Although hiring interpreters is not feasible for all companies, firms are adjusting by recruiting multilingual personnel and using AI and automated translation solutions [3]. This study delves into the changing language training requirements during the COVID-19 pandemic, the equilibrium between personal and group sessions, and the efficacy of language assistance tools, including AI.

2. The purpose and hypothesis of this study

2-1. Purpose

Considering the pandemic' s impact on work methodologies and the swift integration of communication tools, this study aims to reassess language training methodologies in line with changes in business efficiency and linguistic interactions.

2-2. Hypothesis

AI and Web services offer limited assistance for global assignments. Nonetheless, technological solutions that address specific shortcomings will further propel business. Underlying language training demands differ among age demographics, and customizing training modules based on age can amplify cost benefits.

2-3. Method

We conducted an online survey from September 30, 2021 to October 8, 2021, using a questionnaire consisting of 20 questions to validate the hypotheses of this study. We reached 54,149 people based on the following three conditions: (1) they worked for companies or organizations with over 300 personnel; (2) they worked remotely; and (3) they had knowledge of overseas work activities in their workplace. In total, 8,734 respondents qualified for the survey. To avoid age and gender bias, we set equal numbers of age groups in which the genders were equally distributed. Those aged 18 to 19 years and over 50 years were eliminated because the gender distribution differs from other age groups. As a result, a group of 355 respondents was selected by dividing them into eight age groups ranging from 20 to 50 years old in 5-year increments. This study included 351 valid respondents.

3. Results and analysis

3-1. Shifts in International Business Practices Owing to Remote Work Integration

The escalation of remote work has intensified English interaction in global ventures. According to our survey, more than 62.7% of enterprises have integrated online conferencing tools for international interaction. Major corporations, particularly those with high headcounts and large staff, have incorporated online conference solutions to counteract business interruptions (See Figure 1).

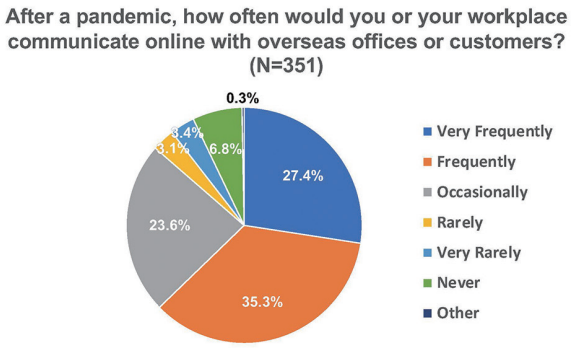

Figure 1 : Trends in communicating with overseas following the pandemic

The swift adoption rate of virtual meeting platforms, such as Microsoft Teams and Zoom, indicates this trend. The broad acceptance of these instruments has transformed business discussions and infiltrated domains such as education [4]. What changes have led to the expansion of remote work in operations? As shown in Figure 2, the number of tasks related to meetings increased, including online meetings (65.2%), responding to e-mails (56.8%), and writing reports (53.8%). This confirms that, even during the period when overseas travel was restricted, respondents continued to perform international business tasks (See Figure 2).

Which specific international business tasks have become more frequent for you since the pandemic? (Multiple answers)

	Responses	(%)
n	132	100.0%
Responding to e-mails	75	56.8%
Online meetings (business negotiations, presentations, etc.)	86	65.2%
Preparation and presentation of reports	71	53.8%
Procurement-related (purchasing, buying, and selling)	45	34.1%
Responding to information inquiries and queries	44	33.3%
Overseas projects (preparation, implementation, supervision)	34	25.8%
Service deployment overseas (preparation, implementation, research)	30	22.7%
Participation in international conferences (online/offline)	29	22.0%
Recruitment interviews (online/offline)	33	25.0%
Participation in exhibitions (online/offline)	34	25.8%
Recruitment interviews (online/offline)	36	27.3%
M&A	30	22.7%
Import/export	23	17.4%
None applicable	1	0.8%

Figure 2. Changes in the need to perform specific international business tasks.

In many cases, owing to rapid changes, it is not possible to develop language skills over time. To accomplish this, changes in thinking and methods are required. For example, by changing from an individual-based system to a team-based system, we can reduce individual workload while creating results through collaboration. By making the best use of available tools and resources, respondents were able to overcome these difficulties.

3-2. Evolution of Business Operations and Hurdles

A 2019 IIBC poll revealed that 61% of the TOEIC exam participants employed English when collaborating on international projects. This percentage is projected to be 38.8% in the next three years [5]. The impact of the pandemic has accelerated the transition to more frequent online negotiations, agreements, presentations, and email communications. However, challenges persist in speaking and comprehension (See Figure 3).

Figure 3. Difficulties found in online meetings.

While online conference tools can transcribe discussions, meeting participants often misinterpret non-native English. This situation emphasizes the need for training in initial listening and comprehension skills (See Figure 4).

Figure 4.1 Most respondents wanted corporate language training programs,

According to the survey results, “Business English Conversation” ranked first overall, with 62.1% of respondents wanting to see it added to training programs within their organizations. The second was “Presentations" at 50.5%, and third was “Negotiation” at 40%. The difference between the first- and third-place items was approximately 22%.

With the increase in participation in online meetings, there is a high demand for programs related to skills, such as presentations and meetings, which are directly related to work. Interestingly, many companies had been offering the above programs before the pandemic, but this survey item lists the programs that they would like to see in addition to their existing curricula.

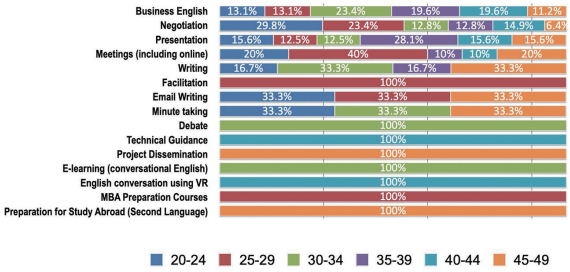

Figure.4.2 Most respondents wanted corporate language training programs organized by age group.

As Figure 4.2 shows, there is strong demand for business English across all age groups, while other skills such as facilitation, debate, technical guidance, and project dissemination were dominant only for certain age groups. Reflecting on active participation in online business activities for those aged 20 to 29, results showed interest in writing emails, taking minutes, and negotiating Business English.

New employees and those in the early stages of their business careers in business typically take CEFR-based Business English training programs that focus on situational business communication in general. However, they often find themselves regularly arranging online meetings with agendas and minutes attached to emails as well.

Those in middle management, aged between 30 and 40, aim to acquire Business English as their primary skill. However, their responses also show a competitive demand for presentation and meeting skills over Business English. Middle managers require practical Business English skills, such as the ability to engage in complex and lengthy discussions that build on their knowledge of human resources and management.

This indicates that a simple scene-by-scene study like a traditional coursebook would be insufficient. Therefore, the language education programs that are now being sought after are those that focus on skills for analyzing issues encountered in modern work situations, accurately interpreting messages, and sending messages that effectively communicate the learners' intentions.

Based on the available data, it can be inferred that the existing business English courses are effective in teaching fundamental language skills in professional settings. However, to further enhance the practicality of the learners' experience, it is crucial to explore the most effective methods of catering to their needs and preferences.

3-3. AI/Web Services Utilization

Advanced linguistic competencies are crucial in digital discourse. To mitigate language proficiency deficiencies, 72.6% resorted to AI or Internet-based language aids, with 74.5% confirming a decline in language obstructions (See Figure 5).

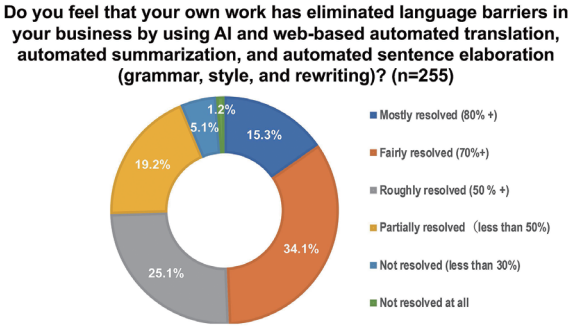

Figure 5. Utility of AI and web-based language assistance in reducing language barriers at work

Responses to the survey highlighted specific difficulties in translating specialized terms, with 78 respondents expressing this concern. The comments indicated a deficiency in vocabulary related to industry-specific, legal, and association terms. The accuracy of the translation remains a significant issue, with a notable demand for tools that can capture and represent nuances, particularly in Japan.

As we reviewed the responses, it became apparent that an overreliance on literal translations has resulted in the mistranslation of industrial jargon and technical terms, with consistent feedback suggesting a lack of contextual understanding of the tool. There is a need for the tool to be more human-like in its understanding and interpretation of content, especially in negotiations and with colloquial terms. Some users reported the tool taking liberties with translations without their command, leading to unintended translations. The survey results also indicated that 40% of respondents used free translation tools, suggesting room for improvement if more specialized or paid tools are used. However, further improvements in translation accuracy are still expected, as highlighted (See Figure 6).

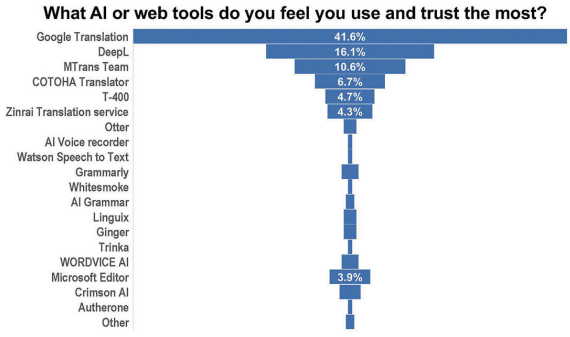

Figure 6. Preferences for AI and web-based automation tools on the job/at work

While these tools are appreciated for their current functionality, there is considerable scope for improvement, especially in terms of specialized terminology and nuance. Addressing these areas will greatly benefit users and enhance their experience. Thus, it is imperative to remember that, for the foreseeable future, human beings must evaluate and refine the output of AI based on their respective expertise.

4. Conclusion

The COVID-19 pandemic has necessitated a paradigm shift in business operations and heightened the demand for industry-specific language proficiency. Our research indicates that Japanese professionals are increasingly utilizing artificial intelligence (AI) and web-based language tools to enhance their communication skills. As AI linguistic models advance and specialized vocabulary expands, their commercial utilization will become more widespread. Therefore, customized business English training that is tailored to the age and proficiency levels of individuals is crucial. Specifically, individuals in their twenties may benefit from training in email communication and minute-taking, while those in their thirties may focus on presentations and negotiations. Proper customization based on needs analysis can lead to increased cost efficiency for language training and better business outcomes.

Furthermore, as the role of AI in global communication continues to expand, it is increasingly critical to understand cultural nuances and value intercultural communicative expertise. While AI can assist in overcoming linguistic barriers, individuals must also rely on their intellect and specialized business communication knowledge to avoid an over-reliance on AI.

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