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Fostering excellent next generation

Asia & ASEAN Center for Educational Research
Faculty of Education, Chiba University

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CHIBA UNIVERSITY

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Edited by

Asia & ASEAN Center for Educational Research
Faculty of Education, Chiba University

1-33, Yayoi-cho, Inage-ku, Chiba-shi, Chiba, 263-8522 Japan
Tel: +81-(0)43-290-2513
E-mail: edu-twincle@chiba-u.jp

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Foreword

In the 21st century, rapidly evolving communication technologies centered on the Internet create a new world that fuses real and virtual space. In the new world that is about to begin, every young person must play a leading role in creating new values and the future way of life for humanity. Therefore, it is the mission of universities of higher education to develop human resources to lead this new era. In this book, we disclose the highly specialized human resource development that each university is engaged in. Based on this information, we aim to develop joint research further and establish cooperative relationships.

Jun Nomura, M.D., Ph.D.
Director of Asia & ASEAN center for Educational Research,
Faculty of Education, Chiba University, Japan

ASCENT Program: A new initiative to nurture scientific researchers from high school students

Jun Nomura[1], José Said Gutiérrez-Ortega[2,3]

[1] Faculty of Education, Chiba University
[2] Institute for Excellence in Educational Innovation, Chiba University
[3] (Current affiliation) RIKEN Interdisciplinary Theoretical and Mathematical Sciences Program

1. A new initiative to foster advanced scientific personnel

1.1. Background of the development of a new program to foster young researchers

Society 5.0 will allow people to freely access information anytime and anywhere, but they should be always able to judge, select and analyze useful information, and propose and achieve a new world in which the perspectives of the sciences and technology are considered. Therefore, the leaders of the next generation are expected to have the ability to create new values by combining virtual and real spaces in order to fulfill the basic and the intellectual needs of the society.

1.2. Purpose of the educational program developed

In order to nurture the next generation of human resources with problem-solving skills to create a future on their own, we believed it was necessary to add a new element to the existing early education plans and deepen its development. We think that encouraging critical thinking, data science skills, and communication abilities such as debating skills are indispensable to nurturing researchers who are suited to the new era. To this end, we have developed the new educational program "Advancing the Society 5.0 by Coordination of ENGINE Talent Promoting (ASCENT)". This program is based on the Accelerated Program for the Revitalization of University Education (AP), which was implemented for six years starting in FY2016 to further enhance our activities in line with the progress of the program and to reform the system after the support ends.

We promote the ASCENT Program as a new educational program to foster young researchers who can model the world based on evidence and disseminate their findings to the world. The development of this program was based on Chiba University due to its longstanding research support and collaboration with students from high school education. We have also provided educational support to school teachers for many years, and we have promoted educational collaboration with teachers from primary to higher education. Furthermore, Chiba University launched the ENGINE program in 2020 to strengthen university education capabilities. Currently, the university is also working on a new education that integrates the humanities and sciences to strengthen the development of global thinking capabilities. Such a program seeks to stimulate all students to study abroad and utilize smart (online) learning tools, strengthen data science education, and develop a curriculum to promote the ability to apply data science.

2. Program Overview

The ASCENT Program consists of a two-stage selection and training steps (Figure 1), using a similar method that Chiba University developed in the Future Scientists Training Program started in 2008. This approach was also implemented in subsequent educational programs in accordance with the regulations of the Global Science Campus of Chiba University.

2.1. Human resources to foster through the ASCENT Program

The ASCENT program aims to develop individuals who can find points of agreement among diverse values. Human resources will be the future leaders in creating the Society 5.0, and will comprise the next generation of outstanding problem-solving scientists and engineers who will be active on a global scale. Therefore, the basic ability to be acquired by the human resources in this program is "the ability to always learn and grow by oneself" in order to become the researchers who create new values in Society 5.0.

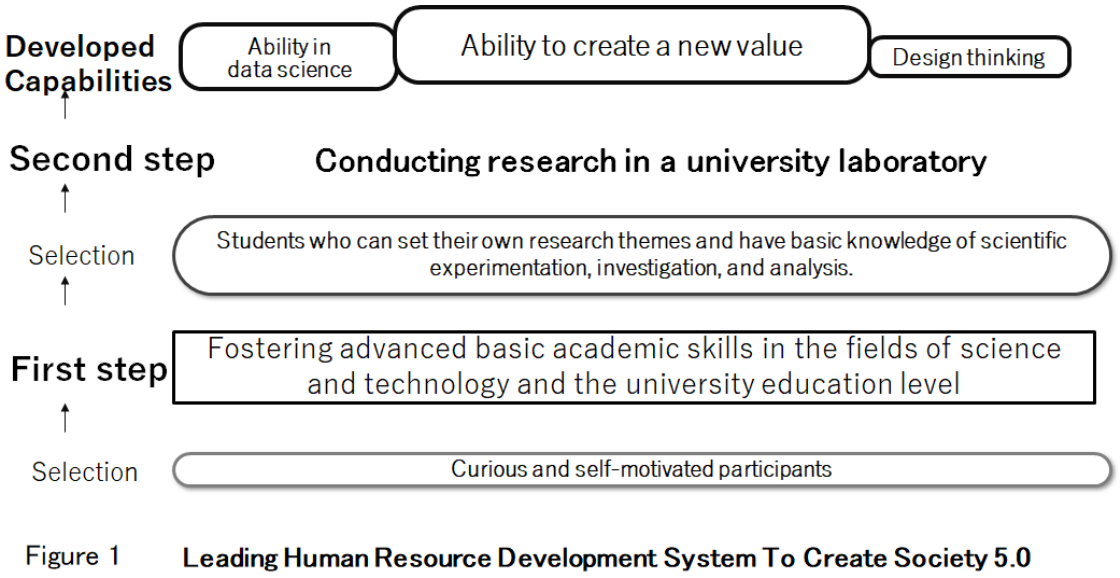

Figure 1 **Leading Human Resource Development System To Create Society 5.0**

2.2. Competencies and Component Factors of Human Resources for Society 5.0

The abilities ultimately developed in this educational program are for future value creation, design thinking, and data science knowledge (Figure 1).

The factors that comprise these abilities are: 1) proactivity, 2) information gathering based on curiosity, 3) multilateral analyses, 4) ability to communicate ideas and concepts, 5) scientific and logical thinking, 6) design, and 7) capability to understand the ideas from a bird's-eye view. These are critical points used for the selection and nurture of the "out-of-the-box" human resources in this ASCENT program (Table 1).

Table 1. Competencies required by students who wish to become researchers

	Competencies to be acquired	Capabilities Details
1	Proactivity	The most basic quality that the participants in the program will be required to equip with from the start. This quality will be reinforced during the program by guiding students to become resilient researchers.
2	Ability to research information based on curiosity	Ability to collect and analyze information. In this way, be able to gather information from multiple perspectives rather than thinking in shortcuts.

3	Ability to analyze from multiple perspectives	Ability to gather information from the internet from a holistic perspective adapted to Society 5.0, rather than from a nearsighted viewpoint.
4	Ability to communicate, connect and collaborate with people	This is the ability to build human networks. Since it is natural to build virtual networks using social networking services, the ability to build human networks among researchers and in general society is an important ability that will revolutionize the times.
5	Logical thinking	The ability to accurately recognize the nature of science through the philosophy of science, and to think and conduct research scientifically based on knowledge of logic.
6	Ability to create new values through design	The ability to create new values in society is necessary. It is an ability to build new mechanisms based on the fundaments of society, to add value, and to create needs.
7	Ability to see the whole picture	Understand the image of contemporary society and be able to position one's research based on design thinking.

2.3. Goals abilities and to be nurtured qualities as a global researcher in the ASCENT Program

This program aims to form the foundation of researchers and sprout their abilities. For this purpose, the program aims to cultivate the following abilities in particular:

(a) Ability to plan a research project.
(b) Ability to utilize data science (using analytical and programming skills).
(c) Ability to present and respond logically.
(d) Ability to discuss with researchers on an equal footing.
(e) Ability to discuss research in the English language as a global researcher.

3. Structure of the Educational Program of ASCENT Program

The plan consists of two selection stages. In the first stage, high school students, mainly from high school in Chiba Prefecture, apply for their selection. After a selection screening, a total of 40 students are selected to develop their basic skills as researchers in a "Basic Course for Advanced Science". In the second stage, fifteen students that prepare and develop a research plan based on their own interests are selected in consideration of the quality of the research proposal, and the feasibility and logic of the research proposed. The selected students conduct their research under the support of university faculty members. Students are encouraged to actively present their research results at domestic and international conferences and presentations, thereby developing their qualities as global researchers.

3.1 Publicity and Recruitment Activities for the ASCENT Program

In order to develop such a workforce, it is important to attract qualified students to can become potential applicants to be recruited in the program. Therefore, it is necessary to conduct various publicity and recruiting activities. For recruitment activities in Chiba Prefecture, we distribute pamphlets and application information to all high schools in the prefecture through the Chiba

Prefectural Board of Education and the Chiba City Board of Education. Also, direct visits to high schools are done to distribute pamphlets and detail further information to the high school authorities. The same publicity activities are conducted for private high schools. We created a website that is linked to the websites of the cooperating organizations on campus, and conduct advertising activities to reach as many high school students, high school officials, and parents as possible. Besides, we also use advertisement services on popular social networks such as Facebook and Instagram (Meta Inc.) to reach a wider audience. For that purpose, we target advertisement to two main public: 1) young social network users from 14 to 25 years old from Japan, who are within the range of being high school students and possible elder siblings that can share the information, and 2) adult public from 40 to 50 years old from Japan, who might be parents of high school students.

3.2. Perspectives and Methods of First Applicants Selection

3.2.1. Perspectives of Selection

The criteria for the selection are set in terms of “proactive behavior” (ability to be independent), "ability to research information based on curiosity," and "ability to analyze from multiple perspectives (Table 2).

Table 2. Rubric for the first applicants’ selection

Criterion	Method	Evaluation Scoring	Supporting documents	Data to be used from the evidence
Proactive behavior	Attitude toward research	4: Actively conducting experiments on their own	Basic course director's comment, Teaching assistant’s report, Attitude during direct instruction, Number of reports submitted, Experiment notes	Attitude during the experiment, Amount of instructions we give, Quality and quantity of reports, The status of the experimental notes
		3: Basically proactive, but sometimes need assistance		
		2: Delays when lacking support		
		1: Cannot improve without receiving instructions		
Ability to research information based on curiosity	Ability to research articles	4: Finding articles of sufficient quantity and quality	Basic course director's comments, Experiment report, research proposal	Amount (number) of references cited, Variety of content (number of different themes),
		3: Finding articles from a variety of related words		
		2: Insufficient quantity and quality of articles collection		
		1: Articles have not been collected		
Ability to analyze from	Whether there is a	4: Can explain the background of the	Assignment Report	Variety of perspectives when

multiple perspectives	variety of ways of perceiving the research subject	experimental theme from various angles 3: Can explain experimental topics from some diverse perspectives 2: Can explain an experimental topic in terms of about two perspectives 1: Can explain the experimental topic only from the point of view in the manual		explaining a theme in a discussion Number of perspectives in discussion

In addition, the plan is to further evaluate the applicants by using the following auxiliary perspectives: (a) interest in science, (b) attempt to express oneself, (c) ability to imagine the future, (d) richness of ideas and opinions, (e) a certain degree of flexibility, and (f) high reading comprehension (and comprehension skills in general).

3.2.2. Selection Method

The selection is made on the basis of the following materials:

(a) School recommendation form (in case of high schools from Chiba Prefecture) or self-recommendation form (in case of high schools from other prefectures).
(b) Report of previous activities (it includes scientific programs, school fairs, and reading that the student has completed).
(c) Self-recommendation video and assignment report.

The Report in (b) was used as a reference to learn about past scientific activities and read history on science. The assignment report in 3) is a written proposal on how to conduct a feasible research project that will yield realistic results, and that will be prepared under the advice of a faculty member in charge of the program. The self-recommendation video in (c) is a self-introduction by the applicant to express the motivations of the student to enter and participate in the program.

3.2.3. Selection Method

The selection of 40 applicants is carried out through joint review by the faculty members of the Next Generation Human Resources Support Office, and the faculty members in charge of the implementation of the ASCENT Program.

3.3. Training of students in the "Basic Course for Advanced Science”

In this stage, emphasis is placed on developing the basic skills necessary to become a researcher. The program includes courses comprising distinct subjects are conducted online, so that students in remote areas can also participate.

3.3.1. Basic Course for Advanced Science

All selected students will be required to take common course lessons to develop basic skills:

(a) **Philosophy of Science**: Students learn the origin and the characteristics of science.

(b) **Research ethics**: Students learned about basic ethical ideas concerning the ethics in research, and bioethics in specific, that should be considered when conducting research.

(c) **Data Science**: Students learn basics f programming skills by practicing Python, and develop a foundation on data science concepts.

(d) **Logic and Analysis**: This course is offered to understand and practice basic logical thinking as a researcher. Students learn the fundaments of statistics and how to utilize statistical tools. Also, students learned and practice basic concepts of deduction, induction and abduction.

(e) **Debate Course**: Students learn and practice the basics of debate and discussion. Based on this, they can improve their scientific communication skills.

(f) **Social Design**: Future leaders need a way of thinking that allow them to design the world from a comprehensive perspective. In this course, students deepened their understanding of the fundamentals of social design.

(g) **Basic Scientific English Conversation Course; English Conversation Instruction**: English one-to-one conversations about scientific topics are conducted with instructors with excellent English skills. In this way, students can practice their English conversation skills to develop basic communication abilities; these are the basis for international competence.

3.3.2. Elective courses

To arouse interest in diverse scientific fields and to gain new knowledge, it is important to have hands-on experience. For this reason, Scientific experimental lectures that consist on common scientific experiments from different fields are provided.

3.3.3. Responding to individual needs: Individual study and research guidance

The coordinator of the program tracks the status of all the students, follows the participation of students in the different lectures and assignments, and provides periodical individual support through online consultation during to ensure optimal individualized learning.

3.4. Development and Implementation of Training Programs in the Second Stage

Students who acquire basic skills in the first stage courses, and that have a specific research plan, prepare a research proposal under the advice of the coordinator. The proposal will be evaluated in a secondary selection step.

3.4.1. Secondary Selection

Basic knowledge, ability to search for information, logical thinking, and ability to identify useful information as the basis for a research planning are scored in terms of the seven development objectives (Table 3).

Table 3. Rubric for 2nd[t] step selection

Criterion	Method	Evaluation scoring	Supporting documents	Data to be used from the evidence
Proactive behavior	Attitude toward research	4: Actively conducting experiments on their own	Basic Course, Director's comment, TA's report Attitude during director's instructions, Number of reports submitted, Experiment notes	Attitude during the experiments, Amount of instructions given by the director and coordinator, Quality and quantity of reports, Status of the experimental notes
		3: Basically proactive, but sometimes need assistance		
		2: Delay when lacking support		
		1: Cannot improve without receiving instructions		
Ability to research information based on curiosity	Ability to research articles	4: Finding articles of sufficient quantity and quality	Basic course, Director's comment, Experiment report, Research proposal	Amount (number) of references cited, Variety of content (number of different themes)
		3: Finding articles from a variety of related words		
		2: Insufficient quantity and quality of articles collected		
		1: Articles haven't been collected		
Ability to analyze from different perspectives	Whether there is a variety of ways of perceiving the research subject	4: Can explain the background of the experimental theme from various angles	Assignment reports	Variety of perspectives when explaining a theme in a discussion, Number of perspectives in the discussion
		3: Can explain experimental topics from some diverse perspectives		
		2: Be able to explain an experimental topic in terms of two perspectives		
		1: Can explain the experimental topic only from the point of view of the manual		
Ability to connect and collaborate with many people	The ability to build human networks among researchers	4: Ability to interact and collaborate with a variety of people while performing a research	Quantity and quality of collaboration with others when conducting a research	Ability to engage with others to conduct and develop research
		3: Ability to conduct research while working with a variety of people		
		2: Can work with several people to perform a research		
		1: Research alone without the involvement of others		
Logical thinking	The ability to accurately	4: Can read accurately and explain logically	Discussion reports and experimental	Are the data supported and explained?
		3: The data reads accurately,		

	recognize the nature and to think and conduct research scientifically based on knowledge of logic	but the logical development remains ambiguous	notes	Degree of scientific and logical thinking during data analysis
		2: There is a partial bias in the way the data is read. As a result, the logical development is unreasonable		
		1: Logical development does not work well due to poor reading of data		
Ability to create a new value through design	The ability to create a new value in the society	4: Think about how research can be developed and contribute to society	Reports, Experiment notebook, TA report, Research seminar evaluation	Ideas about the prospects of the study
		3: Can explain the development of the research		
		2: Can think about what is next in research		
		1: Understand current research findings		
Ability to see the whole picture	Understand the image of contemporary society and can position one's research based on deign thinking	4: Understand how the research contributes to the research world	Reports, Experiment notebook	Understanding the position of the research theme
		3: Understand where the research is in the field		
		2: Can explain the research related to the research results		
		1: Can explain the results obtained from the research		

3.4.2. Implementation schedule (research period and research presentation period)

Students who are able to formulate a solid research theme and a feasible implementation plan are requested to write down their ideas during their application to enter the ASCENT Program. A joint review is conducted by the faculty members in charge of the Next Generation Talent Support Office and the faculty in charge of ASCENT Program implementation and decide whether the research plan is appropriate. If the reviewers find the research proposal adequate, the student is immediately selected also to the 2nd selection step of the ASCENT Program. This is referred as to "immediate selection" at the 2nd stage.

If the student does not propose a solid plan during the application process, the coordinator gives guidance to the student during the Basic Course for Advance Science period. If the student prepares a feasible and solid research plan, the student is selected in the 2nd selection step during or at the end of the Basic Course for Advance Science period. This is referred as to "normal selection" at the 2nd stage.

3.4.3. Matching of research themes

The coordinator continuously supports the students' activities by assisting them in preparing their research plans prior to selection. Specifically, using an online conferencing system, the coordinator guides the student in identifying a research objective and preparing a research proposal and review the student's research topic. If the student is selected in the 2nd stage, the coordinator identifies a laboratory, matches the student with a supervisor (usually, a faculty member from Chiba University), and makes policy decisions regarding the research activities.

3.4.4. Individual guidance for students

During the research guidance, the coordinator provides detailed guidance and appropriate advice by understanding the issues and reasons in cases of research stagnation between the supervisor and the student. For this purpose, software such as Zoom, Slack, and e-mail is used.

3.4.5. Research hours

In principle, the students worked on my research in the university lab, during long vacations and weekends. The students did the parts that they could do at their own school or at home.

3.4.6. Monitoring the progress of research activities

The coordinator continuously interviews high school students online. Based on this, individual online research guidance is provided. In addition, monthly online research seminars that serve as Research Progress reports are held to check the progress of research, identify possible stagnation, and provide appropriate guidance.

3.4.7. Internationalization through overseas study

The education program contemplates that outstanding students that pass the 2nd selection are sent to the laboratories of partner universities in ASEAN (Association of Southeast Asian Nations) countries to gain research experience while observing the progress of their research.

3.4.8. Presentation of students' research results

Students who are conducting research activities are actively encouraged to participate in domestic and international meetings, as well as in workshops with scientific or educational purposes. The advisors and the coordinator may guide the students to prepare and study their presentation material. By participating in various academic conferences and international research presentations organized by the Asia-ASEAN Education and Research Center of the Faculty of Education, students gained experience in presenting research in a global environment and developed their abilities as global researchers.

4. Implementation Structure of the ASCENT Program

4.1. Program Implementation Structure

4.1.1. On-campus implementation system

The "Next Generation Talent Support Office" has been established in the High School-University Connection Center as an organization to manage the program collectively with the Institute for Excellence in Educational Innovation, Chiba University. This office has played a central role in promoting the program as a university-wide organization. Furthermore, in order to ensure the success of this project, it was taken up as a matter for discussion by the Special Committee for the Promotion of High University Collaboration, which is composed of representatives from each graduate school and faculty, to make it clear that this is a project in which all university faculty members will participate.

To further strengthen the high school-university connection, a specially-appointed professor from the High School-University Collaboration Support Office with experience as a high school principal, a professor in charge of Science Studio CHIBA who has experience in science education activities for high school students, and a director of the Asia-ASEAN Education and Research Center, which promotes global science education were appointed to ensure stable course management.

4.1.2. Global Education System

Chiba University collaborated with the TWINCLE (Twin College Envoys Program) Consortium, which is an organization that promotes global science education in major universities and high schools in the ASEAN countries, to develop a global human resource development program in collaboration with overseas educational institutions.

5. Conclusion

The ASCENT Program is presented as a solid program to nurture the young scientific researchers that will face the challenges of the current and future times. The strategy includes the participation of highly qualified personnel in their own areas, such as faculty members who contribute as lecturers or research advisers, and officers that support all the education activities. We expect that the framework presented here can stimulate further educational plans to support high school students in other universities in Japan and abroad.

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Review of ideas and challenges for fostering excellent next generation by the TWINCLE consortium universities in East and South-East Asia

Koji TSUJI

Faculty of Education, Chiba University, Japan

Abstract

To share the information and opinions on systems, activities and concepts for fostering excellent next generation, the TWINCLE consortium universities held an online meeting in February 2022. In the first section of this meeting, each university presented their focusing and conducting systems, activities and concepts for fostering excellent next generation. In the second section of this meeting, the participants discussed effective systems, activities and concepts for fostering excellent next generation. The participnats agreed on the importance of "Quality teacher". As the important categories for fostering excellent next generation, "Capacity development" "Global citizen" and "Collaboration" were proposed. Accoridingly, in the future TWINCLE activities, the consortium universities will more focuse on "Collaboration" for "Capacity development" which "Global citizen" should have.

Main topics

1. Introduction

One of the most important purposes of education should be to foster excellent next generation. To share the information and opinions on systems, activities and concepts for fostering excellent next generation which have been focused and conducted by each university of the TWINCLE consortium[1)], an online meeting titled "Fostering Excellent Next Generation" was held on 6th February 2022[2)]. This meeting consists of two sections. In the first section, each university presented their focusing and conducting systems, activities and concepts for fostering excellent next generation, and the participants shared the information. In the second section, the participants discussed effective systems, activities and concepts for fostering excellent next generation. In this study, I reviewed the information and suggestions for fostering excellent next generation which were presented and proposed in this meeting.

2. Participants

Participants of the meeting are given in Table 1. It consists of 15 universities of the TWINCLE consortium in East and South-East Asia.

3. Information and suggestions given in the meeting

3-1. Section 1 -Presentation-

The presented systems, activities and concepts which have been focused and conducted by each participant are summarized in Table 2. Chiba University (Japan) introduced their activities on science classes, research activities and global activities etc. provided for junior and senior high school students. Bandung Institute of Technology (ITB) (Indonesia) introduced their activities on multicampus and student exchange. Bogor Agricultural University (IPB) (Indonesia) presented the importance to understand character of Y and Z generations. IPB also introduced the curriculum which focuseing on (1) Learning atmosphere (2) New mindset, value, knowledge, skill and attitude for the future (3) New literacy (4) New skills and competencies and (5) Character. Udayana University (Indonesia) presented the importance of (1) Family and parental involvement (2) Education (e.g. Critical thinking skill by PBL) and (3) Social-Economy-Environment. Gadjah Mada University (Indonesia) presented the importance of large collaboration network and also intorduced their

activity collaborating between university and junior and senior high schools. Indonesia University of Education (UPI) (Indonesia) introduced their conducting “Web-based inquiry learning to promote junior high school stundets' inquiry skill and digital literacy”. Chiang Mai University (Thailand) introduced the “20-Year national strategy plan” in Thailand. In this plan, following skills are foucesd; (1) Critical thinking (2) Problem solving (3) Creativity and Innovation (4) Cross-Cultural uniderstanding (5) Collaboration, teamwork and leadership (6) Communications, Information and Media literacy (7) Computing and Digital Literacy and (8) Career and Learning skill and compassion. Chulalongkorn University (Thailand) introduced their conducting online learning activities for pre-service teachers. Kasetsart University (Thailand) presentend the importance of core value, especially on (1) Values and attitudes (2) Behaviors and (3) Skills. King Mongkut University of Technology Thonburi (KMUTT) (Thailand) introduced their conducting teacher training program. Mahidol University (Thailand) introduced their conducting survey on system verification in Thailand. Silpakorn University (Thailand) presentend the importance of core value, especially on (1) Social responsibility (2) Morality (3) Achevement (4) Relationship (5) Trend (6) Excellent (7) Development (8) Universal and (9) Creativity. University of San Carlos (Philippine) introduced the challenges and opportunities for higher education amidst the COVID-19 pandemic in Philippine which consist of (1) Integrate environment and health course in the curriculum (2) Strengthen environmental politics and hygiene practices (3) Incorporate an online mental health and medical services (4) Migrate courses, align cirriculum competencies, and scale-up teachers' teaining for online learning instruction and (5) Strengthen research efforts, data monitoring, and evidence-based practices. National Taiwan Normal University (Taiwan) presented the importance of English Medium Instruction (EMI) under the policy “Bilingual Nation by 2030”. VNU University of Education, Hanoi (Vietnam) presented the importance system based on the characteristics of Y and Z generations.

I summarized the information given by each participant in this section as Fig. 1. As the “Target”, University, High school, and High school-University collaboration etc. have been focused. As the activities for the “Target”, Experiment class, Global exchange, International research meeting, Workshop, and Competition etc. have been conducted. As the “Required skill”, Fundamental literacies, Competencies, and Character qualities etc. were given. These “Required skills” are effected by the “Government policy” e.g. Bilingual nation, generation characters such as Y and Z generations. Based on the “Required skill”, Curriculum, Program, System, e.g., Online learning activities for pre-service teachers, have been organized. Additionally, research to verify the effectiveness of these systems, activities and concepts are also conducted.

3-2. Section 2 -Discussion-

In the Section 2, the participants discussed effective systems, activities and concept for fostering excellent next generation freely. I summarized the information and opinions given by the participants in this section as Fig. 2.

The participants mentioned the importance of the “Quality Teacher”. As the effective strategies to support and train the “Quality Teacher”, (1) Improve social condition (2) Equal quality of education (3) Scholarship (4) Teacher training program (5) Post graduate program and (6) Certificate of quality teacher etc. were proposed.

As the important three categories, (1) Capacity development (2) Global citizen and (3) Collaboration were proposed. As the factors of these three categories, “Communication skill” “Soft skill” “English skill” “International collaboration and partnership” “Collaborative research” and “Co-creation by work together” etc. were proposed.

4. Conclusion

In this meeting, the participnats shared the information and opinions on systems, activities and concepts for fostering excellent next generation. Finally, the participnats agreed on the importance of “Quality teacher”. The participants also proposed “Capacity development” “Global citizen” and “Collaboration” as the important categories for fostering excellent next generation. Accoridingly, in the future TWINCLE activities, the

consortium universities will more focus on “Collaboration” for “Capacity development” which “Global citizen” should have.

Acknowledgments

I am grateful to all the participants in the meeting for their providing useful information and suggestions for fostering excellent next generation.

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Table 1. Participants in the TWINCLE consortium meeting.

Sr. No.	Country	Name
1	Japan	Chiba University
2	Indonesia	Bandung Institute of Technology (ITB)
3	Indonesia	Bogor Agricultural University (IPB)
4	Indonesia	Udayana University (UNUD)
5	Indonesia	Gadjah Mada University (UGM)
6	Indonesia	Indonesia University of Education (UPI)
7	Thailand	Chiang Mai University
8	Thailand	Chulalongkorn University
9	Thailand	Kasetsart University
10	Thailand	King Mongkut University of Technology Thonburi (KMUTT)
11	Thailand	Mahidol University
12	Thailand	Silpakorn University
13	Philippine	University of San Carlos
14	Taiwan	National Taiwan Normal University
15	Vietnam	VNU University of Education, Hanoi

Table 2. Key systems, activities and concepts for fostering excellent next generation (presented by parcitipants in the Section 1)

Sr. No.	System, Activity, Concept
1	Science class Research activity Global activity
2	Muticampus International student exchange
3	Understand character of Y and Z generations Curriculum ・Learning atmosphere ・New mindset, value, knowledge, skill and attitude for the future ・New literacy

	・New skills and competencies ・Character
4	Family and parental involvement Education (e.g. Critical thinking skill by PBL) Soial-Economy-Environment
5	Large collaboration network Collaboration between university and junior and senior high schools
6	Web-based inquiry learning to promote junior high school stundets' inquiry skill and digital literacy
7	20-year-National Strategy plans in Thailand ・Critical thinking ・Problem solving ・Creativity and Innovation ・Cross-Cultural uniderstanding ・Collaboration, teamwork and leadership ・Communications, Information and Media literacy ・Computing and Digital Literacy ・Career and Learning skill and compassion
8	・Online Learning Activities for Pre-service teachers
9	Core value ・Values and attitude ・Behaviors ・Skills
10	Teacher training program
11	Survey on system verification
12	Core value ・Social responsibility ・Morality ・Achevement ・Relationship ・Trend ・Excellent ・Development ・Universial ・Creativity
13	Integrate environment and health course in the curriculum Strengthen environmental politics and hygiene practices

	Incorporate an online mental health and medical services Migrate courses, align cirriculum competencies, and scale-up teachers' teaining for online learning instruction Strengthen research efforts, data monitoring, and evidence-based practices
14	EMI (English Medium Instruction)
15	System based on the characteristics of Y and Z generations

The “Sr. No.” correspond to the “Sr. No.” in the Table 1.

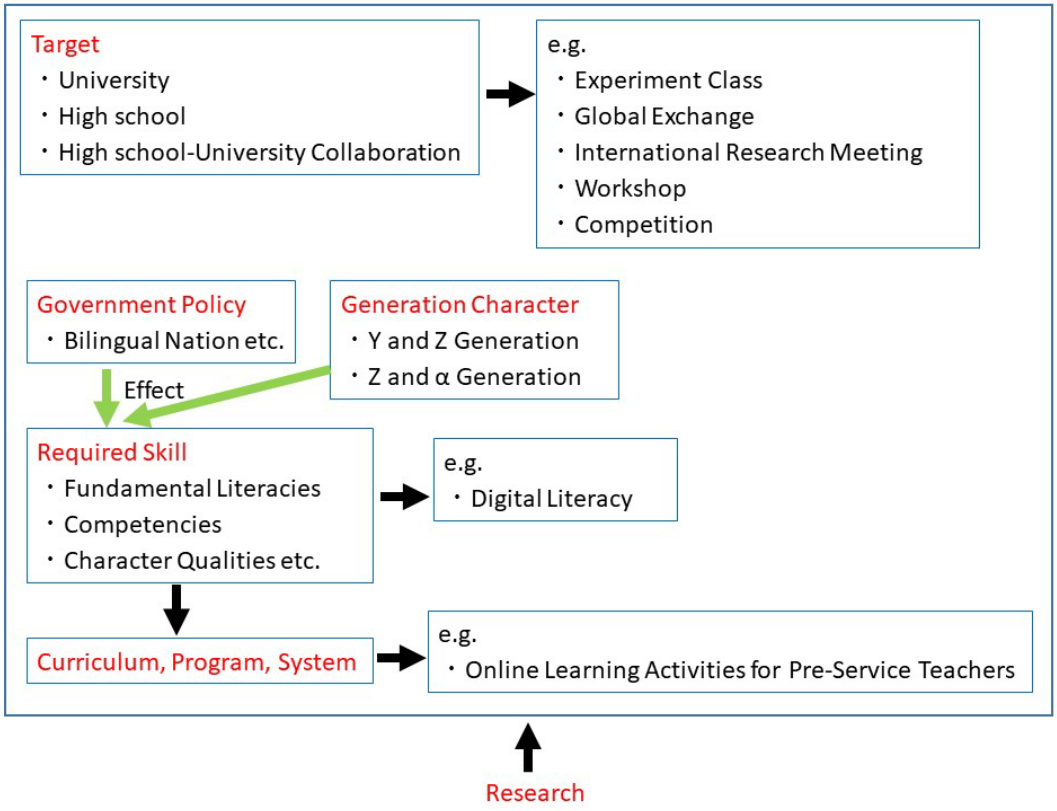

Fig. 1. Summary of key systems, activities and concepts for fostering excellent next generation (presented by participants in the Section 1).

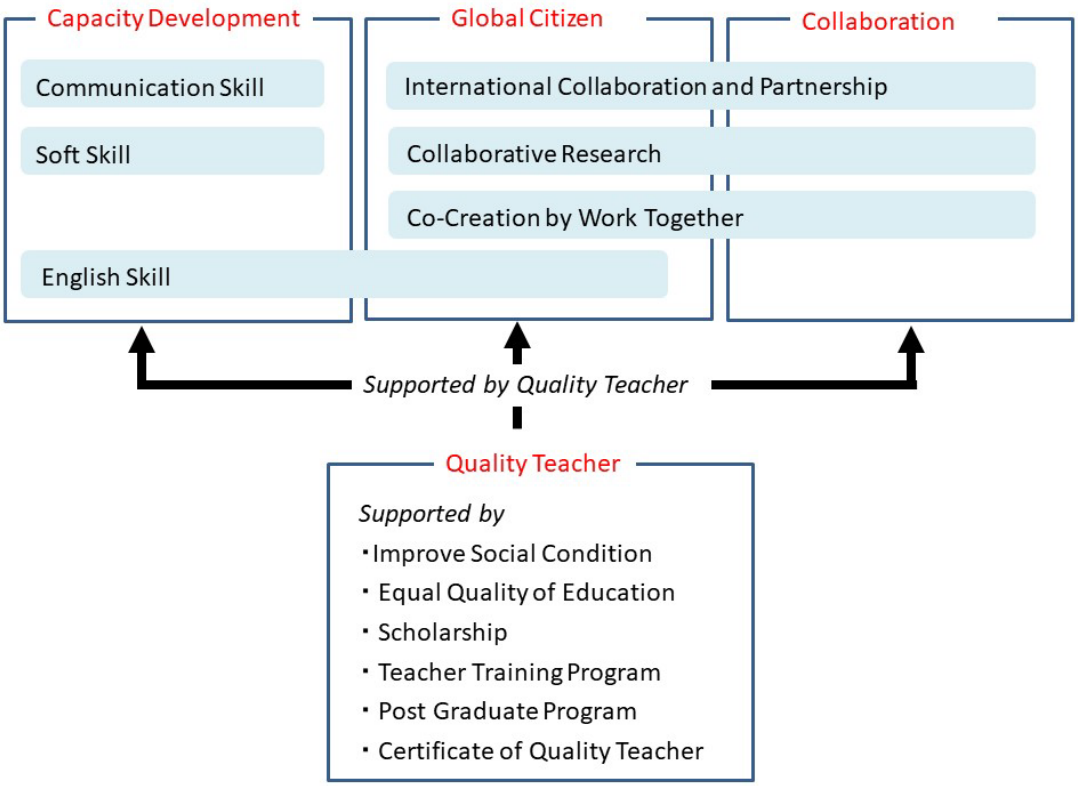

Fig. 2. Summary of key systems, activities and concepts for fostering excellent next generation (proposed by participants in the Section 2)

Online Extracurricular Activities for Pre-service Teachers and Students in the Faculty of Education, Chulalongkorn University: Turning Crisis into Opportunity in COVID-19 Crisis

Atsawanonthapakorn Thanetweeraphat, Pornprom Chaichatpornsuk,
Saisawart Suwannakita, Numpung Supautumporn, Amornrat Boobpachote

Faculty of Education, Chulalongkorn University

Abstract

Because of COVID-19 pandemic, the onsite extracurricular activities have not been organized in schools and universities. Online tools is used widely in education such as teaching or managing the academic activities. For the faculty of education, Chulalongkorn University, teaching and learning management need to change the process to suit the epidemic situation. This study aimed to find the answer that the online extracurricular activities can still support students' skill and desirable characteristic as well as onsite one or not. The three online activities were designed for 1st, 2nd, and 3rd years pre-service teachers to improve their skills in 1) school, parents, and community engagement work, 2) design online lesson plan, and 3) finance and accounting in school context, respectively. In addition, one online activity was designed for junior students in Chulalongkorn University Demonstration School to develop desirable characteristics such as leadership, ethics, or school discipline. Besides, Zoom, Google Slide, Canva, and other online tool were integrated in all ativities. The performance tasks and questionnaires were used as the research instrument. The content analysis and descriptive statistics were used to analyzed the qualitative data and quantitative data, respectively. The finding were found that

1)The first-year pre-service teachers can make own electronics poster created with online tools to indicate their lack of school, parents, and community engagement work skills. The data shown that most students lacked communication skills.

2) Around 95% of second-year pre-service teachers can select the online teaching tools to create their lesson plans such as Quizzes, Kahoot, HP5.

3) The third-year pre-service teachers can use Google Slide to create the project plan for managing budget plan quite completely.

4) The grade 7th students in Chulalongkorn University Demonstration School have 1) a good attitude toward themselves as a Chula Demonstration student, 2) understanding of shool rules, shool activities, learning environment in school, and 3) a good relationships to seniors at the highest level.

Background of the Study

From 2019 to present, aroud the world have faced the problem of COVID-19 Crisis including education in all levels. It effects on learning management process, teaching design which are changed to virtual learning, and organizing extracurricular activities for students (Hoofman and Secord, 2021). For organizing of activities in Education, it is devided into two parts: 1) activities for preservice-teachers (or undergrade students) and 2) activities for students in Chulalongkorn University Demonstration School. The former has been organized according to the announcement of the rules and regulations of ministry of education Thailand about in-service teacher qualifications. it has been defined that the students hold Bachelor's degree of education program have to participate in activities enhancing characteristics of professional teacher and strong citizens through 4 years in program. The teacher institute need to organize and manage at least two activities per year (The Announcement of the Rules and Regulations of Ministry of Education Thailand, 2019). Besides, the latter has

been carried out according to the regulations in the Basic Education Core Curriculum 2008. The extra-learning activities design which depends on students' interest and relates to real life are grouped into three types: 1) guidance activities, 2) student clubs, and 3) social and public interest activities. All schools have to manage and organize these acitivites in all school levels at least 120 hour/year for primary and lower secondary levels and 360 hour/year for upper secondary level (Bureau of Academic Affairs and Education Standard, 2010). In brief, these rules and regulations are framed to administrate setting activities appropriate to preservice teachers or students in demonstration school.

For the organization or segment which administrate and manage the extra-learning activities enhancing desirable characteristics to preservice teachers and student in demonstration school are The Student and Ideal Graduate Development Center (or SIGDC), and Student Affair (SA), respectively. In undergraduate level, SIGDC have two mains mission of this center: 1) To organize the activities effectively and 2) to consult and help students about participating in each organized activities, whereas SA in the demonstration school emphasizes on 1) promoting students about moral, ethics, ledership, public mind, thiking process, desirable behavior and 2) cooperating other segments in schools to develop related work in segment.

In the first semester of academic year 2021, all activities were designed and organized with a new model. Due to COVID-19 pandemic, SIGDC and SA did not organize the activities in ONSITE; therefore, all activities were adjusted in ONLINE instead of that. For undergraduate level, there are three organized online activities: 1) enhancement of school, parents, and community engagement skills through online activity (Online Activity 1; OA1), 2) development of teaching skills with online tools (Online Activity 2; OA2), and 3)development of finance and accounting skills for teachers with online activity (Online Activity 3; OA3). Like basic education level, online activities were designed and set up during COVID-19 crisis such as "New Home" online acitivity to built a relationship between senior student, jonior students, and school (Online Activity 4; OA4). It is the challenge for SIGDC and SA to manage and organize every activities for achieving the objectives and developed desirable characteristics of students under ususual situation.

Objectives

1. To analyze the school, parents, and community engagement skills of the first-year pre-service teachers who participated in OA1.
2. To analyze the using online tools contained in lesson plans of the second-year pre-service teachers who participated in OA2.
3. To analyze the finance and accounting skills of third-year pre-service teachers who participated in OA3.
4. To analyze the level of satisfaction about online acitivity of students who participated in OA4.

Methodology

1. For the OA1, this activity is organized for the first-year students. The online video lesson and online discussion in small group are used to be a main materials in activity. The procedure of the study are four steps as follows: Firstly, SIGDC selected and interviewed two in-service teachers who have worked about engagement of school, parents, and community in a secondary school to create an online video lesson. The selected in-service teacher have been work as a school students affair related to the engagement of school, parents, and community work for more than 5 years in government school context. Secondly, the contents of online video lesson was checked and edited before broadcasting in online platform of the Faculty of Education. The online platform is developed by Technology and Information Center in the faculty of Education and presented in website educhula.net. Thirdly, the first-year pre-service teachers enrolled this activity, studied a case in an online video, took a test, and discussed in small groups with Breakout room in Zoom Meeting. Each group has 5 – 8 members who studies in the same majors such as Thai Language Major group, Science Major group, or Elementary Education Major group and something likes that. Lastly, the participants were assigned to do an electronic poster by which they presented the self-analysis about lack skills related to school, parents,

and community engagement work. The participant can select the application to create their poster freely such as Canvas, Illustrator, or Photoshop. After they do a self-analysis, the data were analyze by content analysis to find out what are skills that students lack and need to improve and use these data to create a new activities in the next semester.

2. For OA2, it is set for the second-year students. The process of this is as following: Firstly, SIGDC designed the activity content and invited an expert in educational technology to introduce online teaching tools. The expert who selected has worked as the lecturer at Office of Educational Technology, Sukhothai Thammathirat Open University for more than five years. Secondly, The second-year preservice teachers enrolled an activity and downloaded some teaching applications beforehand. Thirdly, the participants accessed in Zoom Meeting to participate an online lecture and discussion. Lastly, the participants were assigned to create a lesson plan in which they presented idea using at least two online teaching tools. They have to select the online teaching tools correspond with learning objectives in plan or tools features and shown how to use them in plan. After sending the assignment, these lesson plans were examined types, correctness and completeness of using online teaching tools.

3. For OA3, it is arranged for the third-year students. The algorithm of this shown as follows: Firstly, SIGDC designed the activity content and invited three in-service teachers who have worked in the finance and accounting department in secondary school. Three selected in-service teachers hold a degree in business education major. Not only are they a teacher, but also they have worked as a school accountant in the government school around three to five years. Secondly, The third-year pre-service teachers enrolled an activity and downloaded some worksheet to do a workshop beforehand. Thirdly, the participants accessed in Zoom Meeting to participate an online lecture, to build up concepts of finance and accounting work in school. Lastly, the groups of participants were assigned to design a school project in which they presented planning about budget and use of equipment supply. They have to apply the school finance and accounting concepts in lecture and teamwork skills to their group work. Their projects were checked correctness, completeness, and consistency of budget planning with school budget regulation.

4. For OA4, it is organized for educating the 245 grade 7^{th} students in Chulalongkorn University demonstration school who have been a new students in academic year 2021. The working process starts from the teachers in SA, homeroom teachers in grade 7^{th} class, and representative senior students plan the acitivity together, define the activity objectives, activity pattern, servey the willingness to participate in the project from teachers and students to set a working group, and develop a project proposal for asking some bugget to support. The working group design the 7 sub-activities: 1) school rule, 2) places in school, 3) school clubs, 4) shool uniform, 5) introducing administrators and teachers, 6) Learning in New Normal Era, and 7) school song. The grade 7^{th} students accessed the activity by Zoom Meeting on CUD Plus+ system to participate in an online lecture and discussion to help new student get to know about a new environment and guideline to adjust themselves in a new school, Chulalongkorn University Demonstration School. After the acitivity finished, the participant have to send the online satisfaction questionnaire and give some comments to working group. The data were analyzed with descriptive statictics.

Results and Discussion

1. In OA1, the content in electronic poster were analyzed. The results are found that the top five lack skills related to school, parents, and community engagement work reflected by 396 first-year preservice teachers were communication skills, organized skills, problem solving skills, teamwork skills and compromising skills, respectively. That means SIGDC need to design the activity courses enhancing these skills shown in findings for serving these first-year students in the semester or higher class year.

2. In OA2, the correctness, completeness and types of online teaching tools contained in lesson plans were detected. The results are found that 421 second year pre-service teachers can select at least two online teaching tools to create their lesson plans in many ways such as using Quizzes or Kahoot to evaluate students' learning, using HP5 to built up new concepts with online game, using Padlet to discuss in small group / brainstorm idea, using Face Q or Google Doc or edpuzzle to create a new interactive online learning media. Moreover, around 95% of participants can select the online teaching tools corresponds with learning objectives defined in lesson plans. The finding indicates that most students can be improved teaching skills and may apply skills to create an innovative learning task in their practicum at the fourth class year. However, SIGD still need to design a new activity to help 5% of students who did not improve their skills in the next semester.

3. In OA3, the correctness, completeness and consistency of their project work were verified. The finding shown that the 365 third-year preservice teachers who devided in groups can use PLAN-DO-CHECK-ACT model to create school projects completely. All groups can design and manage budget plan quite completely according to school budget regulations. The finding presented that all groups can be improved financial skills, accounting skill, and teamwork skill as well. They may apply these skills to their practicum at the fourth class year or future school work. Besides, the students feel pleased after doing a workshop and transfering the direct experiences from the in-service teachers as speakers, because they have never learnt about finance and accounting work in depth in the university courses except students in business education major who have some.

4. In OA4, the level of satisfaction about online "New Home" acitivity of 177 grade 7th students were analyzed with descriptive statictics and content analysis. The finding indicated that 1) the students have a good attitude toward themselves as a Chula Demonstration student with knowledge and virtue at the highest level ($\bar{x}$ = 4.61, SD = 0.61), 2) the students have knowledge and understanding of shool rules and regulation at the highest level ($\bar{x}$ = 4.63, SD = 0.73), 3) the students have knowledge and understanding of shool activities at the highest level ($\bar{x}$ = 4.64, SD = 0.67), 4) the students have knowledge and understanding of learning environment in school at the highest level ($\bar{x}$ = 4.64, SD = 0.67), and 5) the student have a good relationships to seniors at the highest level ($\bar{x}$ = 4.76, SD = 0.61).

In summary, the online activities likely to increase direable characteristics in both preservice teachers and students in demonstration school, because online tools have more funtions which support for students' learning and allow student do the extra-learning activities in different physical locations, especially, Zoom is a good choice for organizing the activities: broadcasting content, conferencing, and making small group discussion. In addition to this, Google Slide is appropriate for doing teamwork missions. Thus, these online tools are very essential key for designing, managing learning environment during COVID-19 crisis (Tay & Ramachandran, 2021; Utomo, Sudaryanto & Saddhono, 2020).

Conclusion

All online extra-learning activities designed by SIGDC enhance characteristics of professional teacher of pre-service teachers. Many reflection and feedbacks may be used for design a new activities or adjust some components of previous activities. For instance, SIGDC may design activities focuses on soft skills or other school work skills which pre-service teachers need to improve. For SA in demonstration school, the online activity is quite successful. More junoirs give some positive feedback and good suggestion to remodel some activities in the future such as concising time for activities, creating online game and rewards. These will be considered to explicate online activity in the next academic year. In brief, organizing these online activities will be an experience for faculty of education, Chulalongkorn University to develop activities that are consistent with the social context and the needs of students in the future.

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Plans and Policy for New Generation Development in Thailand: Expectation & Beyond

Assistant Prof. Dr. Uraiwan Hanwong[1],
Associated Prof. Dr. Phetcharee Rupavijetra[1]

1.The Faculty of Education, Chiang Mai University
Chiang Mai, Thailand

Introduction

Changes in the global context of economics, finance, technology, culture, society, resources, and the environment have connected various countries worldwide. The aspect of the economy found that integration of bilateral, regional, and multilateral economic sectors is likely to increase, relying on adaptation mechanisms and policy implementation to enhance competitiveness, international capital movements, and increasingly international financial connectivity. The aspect of information economic technology (IT), information and communication technology is a significant factor in economic development, driven by three leading technologies, namely biotechnology, material technology, and nanotechnology. This combination of technology creates innovations, and the internet system is a fundamental life factor (Office of the National Economic and Social Development Council, 2022). However, the disparity in receiving, application and technology development needs to be considered since these changes impact Thailand. Therefore, the development of science and technology that Thai society cannot fully develop. However, Thailand would import technology to produce products and transfer technology to communities for community economic development in the past. The social aspect is to improve the quality of life, develop Thai youth's learning, way of life, culture and values, and the aspect of the environment in society.

Trends of global change in entering an aging society, Thai people live longer and have fewer children. As a result, education tends to distribute educational opportunities evenly, but the average number of education years is low. Nevertheless, the learning culture of Thai people still encounters problems. Significantly, Thai people still complete only the primary education level. Moreover, the production and development of professional human resources, especially at the middle level, tend to decrease. At the same time, the labor market demands more and more semi-skilled and skilled labor force. The impact of low education bases among the workforce has affected productivity, workforce, including the enhancement of the country's competitiveness reflecting the current situation of education for Thai youths such as the context of education management; children/youths have lower rates of school attendance as birth rates have declined for decades. As a result, the size of the present schools is small, and the number of small schools has increased, spreading across the country. National Education Act B.E. 2542 (1999) provided individuals with greater rights and opportunities for education. There are more educational opportunities and alternatives for children with disabilities and special needs as well. However, dropout rates still exist, particularly at the vocational level and rural areas. In addition, inequalities arise between children from wealthy and low-income families. Moreover, the COVID-19 pandemic has worsened among children from low-income families (Office of the National Economic and Social Development Council, 2022).

The 20-Year National Strategic Plan

Currently, the 20-Year National Strategic Plan officially launched and has been enforced to turn Thailand into a developed country by 2037. The 20-year national strategic plan is developed through its visions of "stability, prosperity, and sustainability" (Office of the National Economic and Social Development Council, 2018). It consists of six areas: security, competitive enhancements, human resource development,

social equality, green growth, and rebalancing public sector development.

The "20-year Strategic Education Plan" will be in accordance with the government's 20-year national strategy. Each education policy is being geared toward the goals of investing in human capital by following and adapting the 21st century skills. The policy must also address stability for the country's development toward prosperity and sustainability, enhance the efficiency in the public sector management and promote good governance. Additionally, the policy must prepare youth for the digital era by equipping them with the necessary skills to adapt to global developments (Office of the National Economic and Social Development Council, 2022).

The preparation must include the correct thinking principles, 21st century skills, English for communication, local dialect conservation, habit of reading, especially lifelong learning, towards high skills persons, innovators, and entrepreneurs.

Developing Thai youths /students to have 21st Century skills

Developing Thai youths to acquire essential learning skills for the 21st century that everyone must learn throughout their lives, including literacy, writing, and arithmetic, which are students' ability to use knowledge and skills to solve real-life problems. It is also known as "literacy" in three areas: reading literacy, mathematical literacy, and scientific literacy (The Institute for the Promotion of Teaching Science and Technology [IPST]. (2008), including seven skills. They are critical thinking and problem solving, creativity and innovation, cross-cultural understanding, collaboration, teamwork and leadership, communications, information and media literacy, computing and ICT literacy, career and learning skills, and compassion (Wijarn Panich, 2013: 17), including learning new skills, which are considered the necessity for lifelong learning (Bellanca & Brandt, 2010) for survival in society (Martin, 2010). These are considered essential for lifelong learning and necessary for the development and economic competition of the country. One of the factors contributing to youth development outcomes is the instructional management of Science, Technology, Engineering, and Mathematics Education (STEM Education). It allows Thai youths to learn and integrate knowledge and skills of Science, Technology, Engineering, and Mathematics to apply for connecting and solving problems in real life. Moreover, it includes the development of new processes or products along with the development of 21st century skills for future careers (Chamrat, 2017; Jitsuchon, 2012).

STEM-focused teaching

The policy driving Thailand, especially in education and STEM has been pushed into a national action plan as presented in the STEM Education Policy proposal report. First, it is a proactive policy to develop youths and human resources in Science, Technology, Engineering, and Mathematics of the Committee on Mass Communication to the Chair of the National Legislative Assembly (Chamrat, 2017). Later, it had the government's policy announcement with the expectation of building the STEM human resources to push the country out of the middle-income trap to upgrade Thailand entering Thailand 4.0 with the emphasis on the country's development through innovations.

According to the STEM approach (STEM Education Thailand, 2014), learning management was conducted by The National STEM Education Center: NSEC. This center is governed by the Institute for the Promotion of Teaching Science and Technology (IPST). The network of STEM Education Thailand consists of the National STEM Education Center, Regional STEM Education Center (RSEC), distributed in 12 provinces across the country, and the STEM School network, which is the main unit in operation. Moreover, there is also a network of academic mentors in universities, education advisors, and a network of academic mentor teachers. All networks aim to drive STEM education in Thailand concretely.

STEM is an educational management approach integrating knowledge in four interdisciplinary areas: Science, Technology, Engineering, and Mathematics, with an emphasis on applying knowledge to solve real-life problems, develop new processes or products that are beneficial to life and work as well as help students to build the connections between four interdisciplinary in real life and work. STEM educational management

is not only about memorizing theories or scientific rules and math, but it is also about building an understanding of those theories or rules through actual practice, along with developing thinking skills, questioning, problem-solving, researching, and analyzing new findings. Moreover, the students should be able to apply the findings or integrate them into their daily lives.

Managing learning according to the STEM approach consists of five characteristics:

(1) teaching with the emphasis on integration;

(2) helping students to build connections between the four subject content and their daily lives and careers;

(3) emphasizing the development of 21st century skills;

(4) challenging students' thinking; and

(5) providing students' opportunities to express their opinions, and understanding consistent with the content of all four subjects. The objective of STEM educational management is to encourage students to love and see the value of learning Science, Technology, Engineering, and Mathematics and realizes that those subjects have something to do with them and can be applied daily.

Sandbox Educational Management Project

Thailand Development Research Institute (TDRI) Thailand has researched and found a solution for educational issues. Thailand, therefore, proposed a policy called Sandbox Educational Management, with a pilot project, as an education sandbox allowing people in areas of all sectors to collaborate to organize education, creating educational innovations and learning to meet the educational quality of students and common learning area, and creating a body of knowledge for expanding results to change of the nation's education. It aims to revolutionize the new educational management model with four main goals: 1) increasing students' learning achievements in three areas (attitudes, skills, knowledge) as well as expand results to the national level; 2) producing /developing educational management innovations at the provincial level extending educational innovations to the national and other areas; 3) reducing the disparities in educational quality by upgrading the learning outcomes of weak and poor students; and 4) integrating networks and collaborating with partnership network in educational management, development, and expansion of educational innovations. There is six pilot education sandbox in six regions, namely Satun Province, Rayong Province, Chiang Mai Province, Kanchanaburi Sisaket Province, and Southern Border Provinces (Office of Educational Innovation Area. Office of the Basic Education Commission, 2019).

As an area of diverse geographical, economic, civil society, environment, and education, Chiang Mai Province is a large area, causing many educational issues. Therefore, a remedial or development process that is appropriate for the area is required. Furthermore, applying development principles should be in accordance with the United Nations' SDGs Development Goals 4 Education for Sustainable Development to create equal and inclusive education and promote lifelong learning.

Faculty of Education, Chiang Mai University has carried out the educational management to develop 11 pilot schools in Chiang Mai province as the modeling schools in the education sandbox, along with the development of a driven management system mechanism to enhance and develop the teachers' competence in the area, consisting of 1) The Prince Royal's College, 2) Dara Academy, 3) Suandek Samkamphaeng School, 4) Romkaew Kindergarten School, 5) Auewittaya School, 6) Pimandek Chiangmai School, 7) Sahavith Piman Chiangmai School, 8) Starfish Country Home School, 9) Chiangmai Christian School, 10) Rattana Auewittaya School, and 11) Sumalee Kindergarten School. Furthermore, the Faculty of Education has adopted the Community-Based Learning concept by using students' characteristics to integrate with social phenomena, future images, and the identity of each area. Moreover, the workshop for teachers' empowerment as coaches as coaching and mentoring along with reflection continuously so that the teachers can apply the concept to plan for develop the instructional innovations as well as develop their learner's competence in the future sustainably.

Furthermore, the Faculty of Education, Chiang Mai University, has conducted U-School Mentoring

project, which is a project to improve the quality of education and locality, and higher education institutions are mentors. The Faculty of Education served as an educational coach and has developed a model school such as Ban Panton School, Mae Wang District, Chiang Mai Province, to achieve Thai youth development objectives.

The example of a school which encourage students to be innovators

Ban Phanton School, as a part of a Chiangmai University-led project, has various objectives, there are :

1. To promote the students and youths acquiring global knowledge and skill;
2. To conduct research inspiring the students/youths to become innovators, the value of school-based learning can be added;
3. To encourage teachers and students to apply their creativity and problem-solving abilities.

The project's objectives have been formulated to be consistent with the 20-year strategic education plan. It is called to enhance teaching outcomes and community development through collaboration with a higher education institution called U-school mentorship.

The project's significant characteristic of the school is the integration of active learning and the development of students into innovators via the lens of Ban- Phanton community's identity. The three focal points include the study of corn, the Community Learning-Resource Center, and 365 days of learning. As a result, it could be concluded that the students have a better ability to inquire for information, analyze it, and synthesize it for a more complete understanding.

These serve as the foundation for project design and methodical work, which are essential for innovators.

Pictures 1 Pratom One students (grade one) planted and studied the corn' growth.

Pictures 2 Students made the paper by using corn husks.

Pictures 3 Students made charcoal by using corn husks.

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IDEAS AND CHALLENGES OF GLOBAL COMPETENCE TOWARDS THAILAND'S TEACHER EDUCATION STUDENTS

Dech-siri Nopas[1] , Chakree Kerdsomboon[2]

1. *Division of Lifelong Learning Promotion for Social Development, Department of Vocational Education, Faculty of Education, Kasetsart University, Bangkok 10900, Thailand*
2. *Division of Educational Psychology and Guidance, Department of Educational Psychology and Guidance, Faculty of Education, Kasetsart University, Bangkok 10900, Thailand*

Abstract

This research study explores ideas on the challenges to develop global competence in teacher education students from Faculty of Education, Kasetsart University. The research study aimed to explore the ideas and challenges' dimensions of global competence 1) the values and attitudes of global competence, 2) the skills of global competence, and 3) behaviors of global competence. The research study was conducted with and qualitative research design. The data required for the research were collected with a data collection instrument of in-depth interview. The questions of the in-depth interview were adapted from the global competence dimensions and developed by the researcher and the experts. Furthermore, the findings revealed that that 1) the teacher education students had the positive attitude to work and live with other people who come from different cultural backgrounds, 2) the teacher education students expressed the positive attitudes and perceptions to learn more of the knowledge and skills that will be able to enhance help their global competence to live better and easier with other people who come from different cultural backgrounds as the global citizens, and 3) they had no stress or anxiety to live and work with people from other different cultural backgrounds. In the light of the findings, it is recommended for a guideline plan according to the outcomes and characteristics of the present teacher students. It is also recommended for educators to consider the global competence in the Faculty of Education program.

Keyword: global competence, globalization, Thailand, university student, teacher student, teacher education

Introduction

In the present, people live in a world beyond borders with the help of technology evolution which helps them connect worldwide. Globalization has made many global people in a challenging position. It is one of the main challenges of the 21st century. People are able to see its presence in almost every dimension of their lives: in economy, politics, culture, media, and especially education (Abdurrahman, 2015). The world is changing – education must also change. Societies everywhere are undergoing deep transformation, and this calls for new forms of education to foster the competencies that societies and economies need, today and tomorrow. This means moving beyond literacy and numeracy, to focus on learning environments and on new approaches to learning for greater justice, social equity and global solidarity. Education must be about learning to live on a planet under pressure. It must be about cultural literacy, on the basis of respect and equal dignity, helping to weave together the social, economic and environmental dimensions of sustainable development. Talking about education, the education for the 21st century is not just coming because it is already here. All of the students have the opportunities and challenges of living and also working in the diverse and different people from other cultures with the rapidly changing world. The universities need to prepare the next generations to understand more about global issues and address what are happening around the world. Plus, the educators also need to re-examine their teaching strategies and programs, therefore all the students can thrive in this global and interdependent society. This interdependent global society is as much the consequence of the need to address huge global challenges, such as sustainability, health and security and education as it is the result of important development in the conduct of international commerce, such as. the European Union, NAFTA, and

the creation of nearly instantaneous worldwide communications using cell phones and the Internet (Lohmann et. al., 2006). In response to the rapid growth of globalization and the growing recognition of the professional associations in teacher education, Thai universities have begun considering the need to add a global competence to their education curriculum/programs. One way to prepare teachers to address the challenges associated with teaching children in a global age is through carefully structured, international and intercultural field experiences where candidates are immersed in another culture. Kerkhoff & Cloud (2020) stated that education leaders should help students in developing global competence for our interconnected world. To be globally competent, students need global competence dispositions and the multiple literacies necessary for participation in a digital and global world. They also showed that teachers must be trained in teaching global competence.

In Thailand, society is becoming more global. According to this, undergraduates of schools and colleges are confronting the challenges of a borderless community. Global competencies are promoted among the undergraduates these days. The relevant research clarified the term "global mindedness" in Thai understanding as: "An extensive view of the world, which takes into consideration cultural pluralism and care of global issues, especially the use of resources and the preservation of the environment. All countries are interconnected and live peacefully together. Every human being is a citizen of the world who bears equal rights and freedoms."

Upon reviewing the literature, the outcomes revealed that the ideas and challenges of global competence in teacher education, together with the relevant studies of ideas and challenges of global competence revealed the possible ways to enhance the teacher education of the global competence students. Thereby, this research study aims to explore the ideas and challenges towards dimensions of global competence 1) the values and attitudes of global competence, 2) the skills of global competence, and 3) behaviors with global competence.

Research Objectives

1) To explore the ideas and challenges towards three dimensions of global competence of Thailand's teacher education students.

Research Questions

1) What are Thailand's teacher education students' values and attitudes of global competence?
2) What are Thailand's teacher education students' skills of global competence?
3) What are Thailand's teacher education students' behaviors with global competence?

Literature Review

What is Global Competence?

Global Competence is a multidimensional construct that requires a combination of knowledge, skills, attitudes and values successfully applied to global issues or intercultural situations. Global issues refer to those that affect all people, and have deep implications for current and future generations. Intercultural situations refer to face-to-face, virtual or mediated encounters with people who are perceived to be from a different cultural background.

A central criterion in selecting the cross-curricular competence for an upcoming PISA cycle is that it provides information on the degree to which students are prepared for fully participating in their society and lifelong learning. Developing global competence is a life-long process, but it is one that education can shape.

Why is it important for students to develop Global Competence?

- Global competence can help young people:
  develop cultural awareness and respectful interactions in increasingly diverse societies;
- recognise and challenge cultural biases and stereotypes, and facilitate harmonious living in multicultural communities;

- prepare for the world of work, which increasingly demands individuals who are effective communicators, are open to people from different cultural backgrounds, can build trust in diverse teams and can demonstrate respect for others, especially as technology continues to make it easier to connect on a global scale;
- capitalize on inherently interconnected digital spaces, question biased media representations, and express their voice responsibly online;
- care about global issues and engage in tackling social, political, economic and environmental challenges.

Global competence thus supports the Sustainable Development Goals (SDGs) both by providing the vision of education the SDGs advocate for, and by encouraging young people to act in the general interest of collective-wellbeing and sustainable development that the SDGs embody (Global competence, 2018). The term global competence has also been used interchangeably with global citizenship. The conceptualizations of global competence from Fernando Reimers, Veronica Boix-Mansilla and Anthony Jackson are particularly relevant as they played a key role in informing the OECD's definition (OECD, 2018). Reimers (2013) state that as individuals and nations are becoming more interdependent, interconnected, and increasingly engaged in their interactions with others from different cultures, it becomes imperative to 'figure out their common humanity and their differences with others (Chandir, 2020).

Dimension 1: Examine issues of local, global and cultural significance. This dimension refers to globally competent people's practices of effectively combining knowledge about the world and critical reasoning whenever they form their own opinion about a global issue. People who acquire a mature level of development in this dimension use higher-order thinking skills, such as selecting and weighing appropriate evidence to reason about global developments. Globally competent students can draw on and combine the disciplinary knowledge and modes of thinking acquired in schools to ask questions, analyze data and arguments, explain phenomena, and develop a position concerning a local, global or cultural issue Development in this dimension also requires media literacy, defined as the ability to access, analyze and critically evaluate media messages, as well as to create new media content. Globally competent people are effective users and creators of both traditional and digital media.

Dimension 2: Understand and appreciate the perspectives and world views of others. This dimension highlights that globally competent people are willing and capable of considering global problems and other

people's perspectives and behaviors from multiple viewpoints. As individuals acquire knowledge about other cultures' histories, values, communication styles, beliefs and practices, they acquire the means to recognise that their perspectives and behaviors are shaped by multiple influences, that they are not always fully aware of these influences, and that others have views of the world that are profoundly different from their own. Engaging with different perspectives and worldviews requires individuals to examine the origins and implications of others' and their own assumptions. This in turn implies a profound respect for and interest in who the other is, their concept of reality and their emotions. Individuals with this competence also account for and appreciate the connections (e.g. basic human rights and needs, common experiences) that enable them to bridge differences and create common ground. They retain their cultural identity but are simultaneously aware of the cultural values and beliefs of people around them. Recognising another's position or belief is not necessarily to accept that position or belief. However, the ability to see through 'another cultural filter' provides opportunities to deepen and question one's own perspectives, and thus make more mature decisions when dealing with others.

Dimension 3: Engage in open, appropriate and effective interactions across cultures. This dimension describes what globally competent individuals are able to do when they interact with people from different cultures. They understand the cultural norms, interactive styles and degrees of formality of intercultural contexts, and they can flexibly adapt their behavior and communication to suit. This dimension addresses appreciation for respectful dialogue, desire to understand the other and efforts to include marginalized groups. It emphasizes individuals' capacity to interact with others across differences in ways that are open, appropriate and effective. Open interactions mean relationships in which all participants demonstrate sensitivity towards, curiosity about and willingness to engage with others and their perspectives. Appropriate refers to interactions that respect the expected cultural norms of both parties. In effective communication, all participants are able to make themselves understood and understand the other.

Dimension 4: Take action for collective well-being and sustainable development. This dimension focuses on young people's role as active and responsible members of society, and refers to individuals' readiness to respond to a given local, global or intercultural issue or situation. This dimension recognises that young people have multiple realms of influence ranging from personal and local to digital and global. Competent people create opportunities to take informed, reflective action and have their voices heard. Taking action may imply standing up for a schoolmate whose human dignity is in jeopardy, initiating a global media campaign at school, or disseminating a personal viewpoint on the refugee crisis via social media. Globally competent people are engaged to improve living conditions in their own communities and also to build a more just, peaceful, inclusive and environmentally sustainable world. It shows how global competence is defined as the combination of the four dimensions (examining issues, understanding perspectives, interacting across cultural differences and taking action), and how each dimension builds on specific knowledge, skills, attitudes and values (Barrett et al., 2014).

Research Method

Design

The researcher adopted a qualitative approach in this research study. The qualitative research helps researchers gain the in-depth information and also obtain the insight of the depth data of the research study. The researcher used in-depth interviews to obtain data from the key informant. The questions in the in-depth interview were created to ask the key informants about the ideas and challenges towards three dimensions of global competence of Thailand's teacher education students which are 1) the values and attitudes of global competence, 2) the skills of global competence, and 3) behaviors with global competence.

Key informants

The researcher employed a purposive sampling method to select nine key informants that best represent the whole population. And there were nine teacher education students from nine different fields of study in teacher education which are 1) field of study in teaching languages, 2) field of study in mathematics, 3) field of study

in commerce education, 4) field of study in digital technology for education, 5) field of study in home economics education, 6) field of study in health education, and 7) field of study in physical education. Plus, these are criteria to select the key informant: 1) they must be the students in teacher education, 2) they must have experiences with the people from other cultural backgrounds, 3) they must have the experience in teaching, 4) they are willing to participate in research study.

Data Collection Tool and Data Collection Process

In this study, the in-depth interview form, which was created after reviewing relevant research studies. The questions are open-ended questions, they were used to obtain in-depth information about the understanding about cultural intelligence of the key informant. The questions asked about the ideas and challenges towards dimensions of global competence of Thailand's teacher education students which are 1) the values and attitudes of global competence, 2) the skills of global competence, and 3) behaviors with global competence. And these are the questions of this research study.

1. In your opinion, do you think you have basic knowledge of other countries' languages, cultures, histories, and geographies? Why? How?
2. In your opinion, have you communicated in a foreign language and used information technology and other tools? Why? How?
3. In opinion, have you ever thought about opening your mind to understand, respect, and appreciate people outside one's own culture? Why? How?

The in-depth interview form was finalized for the application after obtaining the comments and suggestions from the experts.

Data Analysis

The researcher employed content analysis of Luo (2019) to analyze the data by 1) selecting the content that the researcher will analyze based on the research questions, choose the texts that you will analyze, 2) defining the units and categories of analysis, 3) developing a set of rules for coding, 4) coding the text according to the rules, and 4) analyzing the results and draw conclusions.

Research Findings

For the research findings of the research study, the researcher presents the findings according to the research questions as follows:

1) What are Thailand's teacher education students' values and attitudes of global competence?

With teacher education students, they consider global competence is one of the competences that they need to learn in order to live, work, and deal with other global people who are from different cultural backgrounds. They highlighted that learning about the cultural diversities and cultural differences is important for them and people around the world. To become the teacher who will teach the next generation in this era is a job that denies experiencing, confronting, working and dealing with other people from different cultural backgrounds. Especially the teachers who have to teach the next generation in this globalization era with modern technology. And because of the technology that helps them connect with each other easier than before, it totally helps them to have effective communication.

2) What are Thailand's teacher education students' skills of global competence?

As the teacher education students, they consider global competence as the current competence and the competence in the future to teach the next generation. In the future, they cannot avoid working and dealing with other people who come from different cultural backgrounds because of globalization. People, especially the next generation, will use social media and internet platforms to communicate, work, and deal with other people around the world. The students should think about the problems about cultural differences and diversities around the world. The teachers can learn how to teach them to solve the problems, plan how to solve the problem and change the actions by using the knowledge and skills that they learn from global competence to respond to each particular cultural norms and implications for dealing effectively with other people who come from different cultural backgrounds.

3) What are Thailand's teacher education students' behaviors with global competence?

For them, global competence will be the competence that can remind people that everyone is different. Even though they all come from the same country does not mean that they have the same ways of life, it does not mean that they have the same understanding about norms and implication of cultures. Therefore, global competence is the competence that helps people to be more careful of their behaviors when interacting with other people from different cultural backgrounds. When people believe that everyone is different, they can learn how to be more aware of their verbal and non-verbal when interacting with others who come from different cultures. They highlight the importance of teaching global competence to the next generation.

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The Blueprint of Transdisciplinary Concepts of Education for Sustainable Development (ESD) in Thai Tertiary Education

Sovaritthon Chansaengsee[1], Poschanan Niramitchainont[2],
Arisara Leksansern[3], Panchit Longpradit[4]
Educational Management (International Program),
Faculty of Social Sciences and Humanities, Mahidol University, Thailand.

1.Assistant Professor Dr., Mahidol University, Thailand. Email : sovaritthon.cha@mahidol.ac.th
2.Associate Professor Dr., Mahidol University, Thailand. Email : poschanan.nir @mahidol.ac.th
3.Associate Professor Dr., Mahidol University, Thailand. Email : arisara.lek@mahidol.ac.th
4.Lecturer Dr., Mahidol University, Thailand. Email : panchit.lon@mahidol.ac.th

Abstract

This research aimed at surveying the development of ESD with the combination of transdisciplinary concepts and issued into Thai curriculum, and creating the blueprint of transdisciplinary concepts for ESD in Thai tertiary education. Two phases were conducted as the first phase surveyed with 150 specialists who are working for organizations, foundations, educational institutes or association related to ESD, selected by purposive sampling. Whilst, the second phase was to conduct focus group discussion with 10 specialists who are educators and lecturers from certain faculties related to ESD, selected by purposive sampling.

The research findings exhibit that all participants got high score on knowledge and experiences in ESD, which was between 4.12 and 4.85. Moreover, 86 percent of the respondents selected science and technology as the priority subject area, following by social and cultures, environment, economics, and demography, which were 73, 69, 65, and 62 respectively. Besides, there were eight elements required to help frame the establishment of holistic picture of Transdisciplinary Concepts of ESD, including learning settings, learning approaches, environment, economics, demography, social and cultures, science and technology, and goals that can be the core concepts for the blueprint of Transdisciplinary Concepts of Education for Sustainable Development (ESD) in Thai Tertiary.

Keywords: Education for Sustainable Development; Transdisciplinary; Tertiary Education; Multidisciplinary

Introduction

Agriculture is one of the most important economic sectors in Thailand. Thailand has been a successful agricultural society due to the country's well-endowed natural resources. Thailand's agricultural sector is often considered the backbone of the economy. As the producer of most of the food for the population and becomes one of the most productive countries which yield a variety of crops and plants, one philosophy ideated by His Majesty King Bhumibol Adulyadej The Great (King Rama IX) called “Sufficiency Economy” is suitable with the fundamentals of Thai culture.

“Sufficiency Economy Philosophy” is a royal initiative of King Rama IX which has been bestowed upon him for more than 30 years, is a concept that is based on the foundation of Thai culture. It is a development approach based on the middle way and carelessness taking into account moderation, rationality, self-immunity as well as using knowledge and virtue is the basis for living most importantly, there must be "consciousness, wisdom and perseverance" which will lead to "happiness" in real life.

Since the early 2000s, Thailand has applied the Sufficiency Economy Philosophy (SEP) as the guiding principle and framework of our international development cooperation with partners throughout the world. The Sufficiency Economy Philosophy was also endorsed by the United Nations (UN) as an alternative approach toward the achievement of the United Nations’ 2030 Agenda for Sustainable Development and the

SDGs. While the SDGs serve as the global goals for sustainability. Thailand believes that the Sufficiency Economy Philosophy can serve as a "compass" for an international community to achieve those goals together without leaving anyone behind. In partnership with partner countries and international organizations to drive forward sustainable development and achievement of SDGs.

The Sufficiency Economy Philosophy is harmoniously aligned with the SDGs because it has a corresponding end goal: both the Sufficiency Economy Philosophy and the SDGs aim to develop and balance social, economic and environmental dimensions. The overlap, but not contradictory, aspect is that the Sufficiency Economy Philosophy emphasizes the cultural dimension as well, whereas in the SDGs the cultural dimension lies within many goals. and part of peace and cooperation for development has been added. The focus of the Sufficiency Economy Philosophy is sustainability and it has been adopted as the core principle of Thailand's National Economic and Social Development Plan since 2002. (Ministry of Foreign Affairs, Kingdom of Thailand, 2018).

This is how the "Sufficiency Economy Philosophy for SDGs" concept developed. The Sufficiency Economy Philosophy emphasizes the value of local wisdom and culture to address localized development challenges and cultivates sustainability mindsets in people on the ground. Especially, the Sufficiency Economy Philosophy has been applied to many different areas of life before being used to achieve SDGs. Both Sufficiency Economy Philosophy and SDGs have been integrated into Thailand's 20-Year National Strategy Framework and the 12th National Economic and Social Development Plan (2017–2021) including the Thailand 4.0 policy. The plans and budgets of all government agencies of Thailand have therefore been aligned with Sufficiency Economy Philosophy and the SDGs.

Since the beginning, sustainability has been at the heart of Sufficiency Economy Philosophy. Many principles underpinning Sufficiency Economy Philosophy involved efforts to deal with sustainability in Thailand, to balance economic progress, environmental protection, and human needs. Sufficiency Economy Philosophy is also in conformity with the core principle of the 2030 Agenda and can serve as an approach to support the realization of SDGs in the global context. (National Voluntary Presentation (NVP), 2014)

Education is at the heart of creating a more sustainable future. Education for Sustainable Development (ESD) aims to transform society towards peace and sustainability through reorienting education and learning. These are both an opportunity and a challenge. Thus, some educational institutions are integrating the curriculum of Education for Sustainable Development . As an educational policy, ESD mainly means to provide knowledge-based, skill-based, and value-based learning on sustainable development. ESD contributes in many ways to quality education in any educational institution. Teaching and learning transform in all contexts when the curriculum includes sustainability content, and ESD pedagogies promote the learning of skills, perspectives, and values necessary to encourage sustainable societies

The concerns of Education for Sustainable Development have become extensively issued in Thailand for significant years. Some educational institutions have combined the concepts of ESD; the holistic education aiming to empower and encourage learners to develop critical thinking, responsibility for environmental security, economic survival, and social justice, as well as to accept cultural diversity through lifelong learning. The ultimate goal is "SOCIETAL CHANGE".

In higher educational institutions, some universities and some colleges offer or combine ESD concepts into the curriculum. One of the pressing concepts of ESD in Thailand is "Education by Participation". The perspective of ESD in higher education involves three elements, which are environment, society, and economy. All mentioned essential elements could be completed by relying on three educational procedures: the operation of education, decision making in education, and development of quality of life by education. Some higher education institutions arrange courses containing the lesson content on 1) environment, society, and economy 2) green economic and social development that creates sustainability contained in the curriculum that can create knowledge at all levels, and 3) learning about the diversity and different cultures of the world's population for better understanding and cooperation in living without conflict.

Therefore, the study of transdisciplinary concepts of education for sustainable development (ESD) in Thai tertiary education is necessary. This study aimed to survey the development of ESD with the combination of transdisciplinary concepts and issued into Thai curriculum; and to create a blueprint of transdisciplinary concepts for ESD in Thai tertiary education.

Literature Review

1. Transdisciplinary Approach in Education

UNESCO (1998) described the differences between the terms multi-disciplinarity, inter-disciplinarity, and trans-disciplinarity, based on the concept of 'integration'–the act or process of combining parts to compose a unified whole, as follows: multi-disciplinarity is often referred to as the simple combination of mono-disciplinary approaches, which frequently neglects to create unified instances; inter-disciplinarity is often regarded as congregation of divergent perspectives by maintaining its roots in each discipline, which consequently leads to mislaid the unity; finally, trans-disciplinarity is introduced to accommodate global and complex phenomenon, a new shift embodied as integration of knowledge, explaining the "intellectual space", where the nature of the diverse acquaintances among secluded issues can be explored and uncovered, the space where issues are rethought, alternatives reexamined, and interrelations discovered.

In teaching, transdisciplinary approach surpasses teaching across disciplines that put together different courses regardless of creating a united whole of goals formulated in curriculum as found in interdisciplinary teaching, by focusing on divergent collaboration between disciplines; resulting in student's creation of a new understanding of an issue (Smothers, 2020). Similarly, Kompar (2009: 1) stated, 'Transdisciplinary learning is the exploration of a relevant issue or problem that integrates perspectives of multiple disciplines [and sectors] in order to connect new knowledge and deeper understanding to real life experiences'. Additionally, Stahl et al. (2011: 497) noted, 'Transdisciplinary learning is important', as it assists students in gaining better understandings of how their and others' perspectives, knowledge and values make a contribution to multifaceted real-world problem solving.

Since its first introduction and its promising applicability, there have been a number of publications and research studies in favor of transdisciplinary approach in education. For instance, Hammer and Söderqvist (2001) conducted an experiment to find a constructive way to introduce transdisciplinary elements in disciplinary courses. Mateescu et al. (2015) proposed an analysis of the need of introducing the transdisciplinary approach in universities. Sharunova et al. (2018) presented a study to review the current engineering design education at the University of Alberta and to develop a first-year transdisciplinary design course, attributing students' cognitive development. However, few are found under transdisciplinary integrated curriculum. For example, Gürkan (2021) examined the positive and negative experiences of teachers through a model in the process of designing a transdisciplinary integrated curriculum, and found that teachers' experiences were significant in effective design of the incorporated programs.

All in all, in today's world, besides its challenges in complexities of coordinating and managing these programs (Smothers, 2020), transdisciplinary approach is claimed to offer better opportunities to excel, and has been the current trends within education and one of the main emphases in curriculum and instruction (C&I) area of research. This is due to the fact that it allows for stronger collaboration between different disciplines in unified knowledge construction, creation of innovative solutions to resolve global issues in response to the fast changing world and globalisation, and engagement of various stakeholders who have active participation in formulating the curriculum (ibid.). Most importantly, transdisciplinary curriculums are well acknowledged as a driver for a future workforce, owing to the fact they empower graduates to be fully equipped with knowledge, skills and critical and innovative mindset gained from rightly multiple disciplinary perceptions and their correlating contributions.

2. Educational for Sustainable Development

The United Nations (2015) stated the Sustainable Development Goals (SDGs) that addressed the 17 Goals and 169 associated targets which are integrated and indivisible. These goals are supremely ambitious and transformational vision to reduce the poverty, hunger, disease, fear, violence and increase the universal literacy, equitable and access to quality education, health care and social protection, and other aspects that lead to the human well-being. Education is one of the concerning issues as stated in the goal 4 : Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; the goal aims to ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development By 2030. Therefore, achieving inclusive and quality education for all reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development. The goal 4 ensures that all girls and boys complete free primary and secondary schooling by 2030. It also aims to provide equal access to affordable vocational training, to eliminate gender and wealth disparities, and achieve universal access to a quality higher education. In Thailand, The SDGs focuses on SDG 4.1 education for all, with a focus on migrant children (United Nations Development Programme, 2022).

Currently, the 17 SDGs have been implemented at the international, national, regional, local levels. As Sustainable Development is a holistic concept combining social, economic, political, technological, environmental aspects. In the context of Education, Education for Sustainable Development (ESD) or Education for Sustainability (EfS) plays an important role to support the achievement of the SDGs; as UNESCO announced a framework of ESD that focuses on policies, mechanisms, stakeholders, and other practical tools for implementation. The establishment of a quality education system worldwide that endorses a change in knowledge, skills and attitude to lead a more sustainable society. The ESD is a concept developed to systematically understand and change education systems promoting and galvanizing sustainability within the minds, hearts and actions of future generations in all level including childhood education, basic education, tertiary education and non-formal education. There are various basic scientific approaches dealing with sustainable development in teaching and research such as : monodisciplinary refers to that sustainability issues are seen from the very specific professional perspective of a single academic discipline; multidisciplinary refers to the sustainability issues are understood as a parallel interplay of different individual academic disciplines still standing side-by-side and rather separately; interdisciplinary refers to the sustainability issues are treated also reflecting the paradigms, the usually hidden background assumptions, and certain methodological characteristics of individual disciplines; transdisciplinary refers to the sustainability issues are viewed from a broad perspective overcoming the iron-cage of pure scientific academia, also actively involving actors and working on socially relevant solutions, perhaps addressing the global agenda of Grand Challenges until 2030 (Isenmann, Landwehr-Zloch & Zinn, 2020; United Nations, 2015; UNESCO, 2019)

In the tertiary level, colleges and universities promote and include the ESD into educational management, curriculum and syllabus, learning climate, other extra-curricular activities, students' daily routine and life on campus. As university students are future leaders who will continue initiating the achievement of SDGs in various contexts (UNESCO, 2019; Aleixo, Leal & Azeiteiro,2021, Zguir, Dubis, & Koç, 2021, Isenmann, Landwehr-Zloch & Zinn, 2020). In Thailand, universities consider the ESD as an important priorities and engage in university policies and practices. This is a concrete case study from Chulalongkorn University, Thailand has contributed to an achievements of the SDGs by promoting education for sustainable development at all levels both in Thai and international programs; by enhancing capacity-building and skill development among the students in order to provide knowledge necessary skills that could lead to the better implementation of the SDGs. Chulalongkorn University is committed in creating an environment where everyone is treated equally and fairly, regardless of their gender, sexual orientation,

religions, disability or ethnic origins; also fully aware of such diversity within the community, especially among students across equality and diversity of learning to all; encourages lifelong-learning through online courses and training courses for students on campus (Chulalongkorn University, 2022). In Germany, Transdisciplinary teaching and learning formats for ESD called "ZukunftGestalten@MUAS". is open to all Munich university of applied research (MUAS) students. More than half of the 14 faculties actively participate in this teaching and learning format; and cooperate with stakeholders outside. The ZukunftGestalten@MUAS is particular that students work in faculty-mixed teams of five participants. Out of the teams of five participants, students from at least three faculties need to be represented. Each student team is supervised by two teachers. These so-called "coaches" are from different faculties, too. The mix of teachers for supervision intends to promote interdisciplinary co-operation both, between teachers as well as between teachers and students. Further, this tandem of supervision is an element of a team-teaching approach. In total, "ZukunftGestalten@MUAS" thus offers an opportunity to expand the usually disciplinary approach through supervised, guided, and self-experiencing reflection on subject-specific principles of perception and action, linking them to sustainability (Isenmann, Landwehr-Zloch & Zinn, 2020)

3. Philosophy of Sufficiency Economy

Sufficiency Economy Philosophy is a philosophy developed and implemented by His Majesty the late King Bhumibol Adulyadej of Thailand. It is an innovative development approach based on Thai culture, stating that people need to use knowledge and virtues as guidelines in their living (The Chaipattana Foundation, 2017). TICA (2022) described it as a paradigm shift providing a new advancing path, aiming for the betterment of balancing economic, social, and environment concerns in a more all-inclusive manner. Its underlying principle about foundation of living is in line with the 'middle path' or 'middle way' of Buddhism, which, according to Bajželj (2017), it is referred to as the Buddhist understanding of practical life, avoiding the extremes of self-denial and self-indulgence and the view of reality eluding the extreme positions of eternalism and annihilationism. It is practised through the eightfold path of Buddhism between indulgence and abstinence. For one to live a comfortable and sufficient life, he or she could adhere to the integration of Sufficiency Economy Philosophy and the middle path. Actually, self-reliant or sustainable farming was promoted by His Majesty in the 1950s; however, it has been generally accepted that Sufficiency Economy Philosophy was introduced in the 1970s (The Chaipattana Foundation, 2017).

According to His Majesty, "Economic development must be done step by step. It should begin with the strengthening of our economic foundation, by assuring that the majority of our population has enough to live on…Once reasonable progress has been achieved, we should then embark on the next steps, by pursuing more advanced levels of economic development." (The Chaipattana Foundation, 2017). His Majesty stressed that although modern development allows for the economic expansion, it might eventually lead the country to imbalances and crisis such as economic dependence on consumerism, declination of natural resources, degradation of existing kinship and lavishness of people's ability to live on themselves, as discovered in other countries; particularly, if the appropriateness for the people and the condition of the country in its implementation of plan have not been taken into consideration (Piboolsravut, 2004; The Chaipattana Foundation, 2017). Therefore, it is vital to build a 'good and stable foundation' for viable development, essentially right for the people and the country, followed by the subsequent settlement of more advanced progress (The Chaipattana Foundation, 2017). In other words, the first thing to sustainable development is to ensure that the majority of rural people have sufficient to live on, in order for them to steadily form basic economy, and when this succeeds, the importance could be consequently given to the more enhanced economic development of the industrial segment.

The aim of Sufficiency Economy Philosophy is to create a balance and sustainable development of the Thai people to live on themselves with dignity and to be able to cope aptly with the challenges arising from the fast-changing and unpredictable globalized world, through three components or pillars, namely moderation

that means having enough to live a reasonably comfortable life, neither too little nor too much, without hurting oneself and others; prudence or reasonableness which refers to the application of knowledge and rationality to any choice needed to make; and self-immunity which is regarded as the preparation against risks arising from internal and external factors (Royal Thai Embassy Stockholm, 2017).

Although the original practice of Sufficiency Economy Philosophy was set in agricultural or rural sectors, it has been adopted as an alternative to conventionally economic and social development and can be applied to a wide range of problems and situations and at all levels, from individual, organisation, to community and national levels (The Chaipattana Foundation, 2017; United Nation, 2020). It means Sufficiency Economy Philosophy can be put into practice by applying the concept of moderation in performance and reasonableness in rational and critical application of knowledge to yield the expected outcomes, and establishing immunity for oneself and society as a whole to one's daily life and at any level. At the individual level, it follows the principle of living a simple life with one's means without taking advantage of others; at the community level, it encompasses joining together to develop mutually-beneficial knowledge; and finally, at the national level, it suggests an emphasis on pertinence, competitive advantage, low risk, ceasing investment in an excessive degree in response to what is happening in another place in the world, decreasing imports, and over reliance on other countries (United Nation, 2020).

Moreover, Sufficiency Economy Philosophy has been incorporated into the sustainable development efforts in the country and regarded as a vehicle for Thailand to achieve the 2030 Agenda on Sustainable Development (TICA, 2022). Sufficiency Economy Philosophy can be applied to all 17 SDGs, and some examples of prominent applications involve poverty eradication, food security, sustainable economic growth, sustainable industrialisation and sustainable consumption and production (TICA, 2020).

Accordingly, applications of Sufficiency Economy Philosophy can be found in various work. For instance, in community development, Ubonsri and Pannun (2012) explored the concept of Sufficiency Economy Philosophy, how it can be applied, and how it poses physical, social and economic effects, as well as life changes, at community levels, in order to define a policy fostering community developments. Additionally, in health and well-being, Barua and Tejativaddhana (2019) studied the impact of Sufficiency Economy Philosophy on the well-being of Thais and found that there was a positive correlation between Sufficiency Economy Philosophy interventions and well-being across six emerging themes: education, social, economics, agriculture, environment and health. Furthermore, in knowledge management and agile software development, Uamcharoen et al. (2012) incorporated Sufficiency Economy Philosophy into developing a prototype system of virtual herbal centre with animation, as an alternative to traditional ways of herbal studies.

Predominantly, in education, the Sufficiency Economy Philosophy movements started in 2007 with the aim to develop people's sufficiency mindset, which to be successful, it needs to be cultivated at young age, resulting in 23,796 first-level sufficiency-based schools, 742 Best Practice Sufficiency-based schools, and 205 Sufficiency-based Learning Centers (TICA, 2022). These schools and learning centres implement Sufficiency Economy Philosophy in all school activities and administration, particularly by means of action-based learning, questioning, reflection and role modeling (ibid.). However, up to present, from the literature, it is apparent that Sufficiency Economy Philosophy has been mainly applied at teaching, activities and administration levels, but not yet in the curriculum level. But as curriculum is fundamental part of education, and its careful design and well-execution have contributed to the major success of a school, its teachers and students, a Sufficiency Economy Philosophy -based curriculum is indispensable for fostering sustainable mindset.

4. Related research

There are the relevant studies about the Education for Sustainable Development in the tertiary level from many countries. Chotiratanapinun (2015) investigated about the first practical step to achieve education for sustainable development in the context of Thailand's design education. This highlighted on the

development of education for sustainable development in both general education and design and educational technology. The study primarily paid attention to the higher education institutions offering sustainability-related courses within their Design Departments and indicated the general view of education, environmental ethics and the environmental education approach, perspectives of design, and model of sustainability pedagogy. The study from Isenmann, Landwehr-Zloch & Zinn (2020) elaborate more practices on embedding education for sustainable development in tertiary education and how to implement Education for Sustainable Development into universities' curriculum and syllabus. The morphological box for Education for Sustainable Development provides more than 70 million opportunities to implement Education for Sustainable Development for example problem-based learning, blended learning, excursion, projects; for instructors can use the team teaching or group of docents. Universities may use this morphological box for ESD to find out their unique profile and develop proper ways to implement ESD.

In term of student's perception on , Ribeiro et al. (2021) study the univeristy students' perceptions on green campus initiatives as sustainable development dissemination strategies and found only 18% of the students who proactive in sustainable development dissemination and 27.7% of their knowledge and awareness regarding sustainable development. This is in accordance with the findings of Aleixo, Leal & Azeiteiro (2021) that study the higher education students' perceptions of sustainable development in Portugal . The result indicated that only 25% of students reported that the topic of Sustainable Development is widely covered in their course. The vast majority of students (94%) feel that HEIs could do more to equip students with Sustainable Development skills. Students would prefer these skills to be developed through free courses, workshops, practical actions on Sustainable Development or by encouraging volunteering. When asked about the Sustainable Development Goals, half of the students state that they know what they are, but 34% having heard of them but do not know what they are. This reflects the concern of university to put more efforts to actively promote and enhance the awareness of Sustainable Development for students through various activities.

Methodology

This research study had employed Mixed-methods research as a methodology. Explanatory design was implemented as the research had been divided into two phases, "Pave the way to ESD by survey" and "Transdisciplinary Concepts of ESD to the blueprint".

Phase I: Pave the way to ESD by survey

This phase of the study aims to respond the objective 1: to survey the development of ESD with the combination of transdisciplinary concepts and issued into Thai curriculum. The sample group of this research were 150 specialists who are working for organizations, foundations, educational institutes or association related to ESD, selected by purposive sampling due to these set criteria;

1. The ones who were working for organizations, foundations, educational institutes or association related to ESD such as The Office of the Basic Education Commission (OBEC), UNICEF, Department of Environmental Quality Promotion (DEQP), Education Equality Fund (NSO), the Quality Learning Foundation (QLF), Climate Action Academy (CAA), Foundation for Environmental Education for Sustainable Development (Thailand): FEED, and education institutions.

2. All participants had been working in those relevant organizations, foundations, educational institutes or association for more than 2 years.

3. They all have to be parts of the team in running the policies or any related projects.

The research instrument included four sections; personal information, knowledge and experiences in ESD, interdisciplinary, and ESD activities. Descriptive statistics such as mean score, standard deviation, and percentile were used for analysis.

Phase II: Transdisciplinary Concepts of ESD to the blueprint

This phase of the study aims to respond the objective 2: to create the blueprint of transdisciplinary concepts for ESD in Thai tertiary education. The sample group of this phase were 10 specialists who are educators and lecturers from certain faculties related to ESD, selected by purposive sampling due to these set criteria;

1. The ones who are specialists in ESD curricula implemented in higher education.
2. Experiencing more than 2 years on developing and teaching any course associated with ESD.

Focus group discussion was implemented as data collection method. Three sessions of the Focus group discussion were done.

Session I: examine research findings from the first phase.

Session II: discuss the concept of ESD and Transdisciplinary Concepts of Education for Sustainable Development (ESD).

Session III: discuss and create the blueprint for propelling ESD into higher education institutions in Thailand.

To analyze the transcribed data, content analysis was used to go in-depth analysis.

Results

Research Findings I: The development of ESD with the combination of transdisciplinary concepts and issued into Thai curriculum

According to knowledge and experiences in ESD, all participants got high score, which was between 4.12 and 4.85; therefore, they were proper participants of his research. Moreover, with regards to transdisciplinary or multidisciplinary concepts, the research participants motioned five different subject areas, including environment, social and cultures, economics, demography, and science and technology. 86 percent of the respondents selected science and technology as the priority subject area, following by social and cultures, environment, economics, and demography, which were 73, 69, 65, and 62 respectively as presented in figure 1.

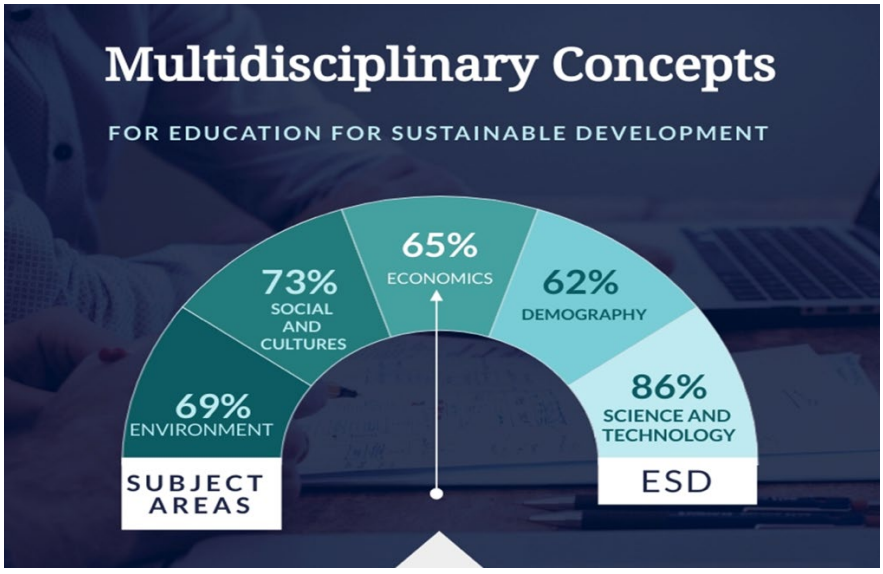

Figure 1 : The percentage of subject areas mentioned by the participants

Research Findings II: The blueprint of transdisciplinary concepts for ESD in Thai tertiary education.

After the data analysis of phase I, the researcher continued studying to answer the second objective of the research; to create the blueprint of transdisciplinary concepts for ESD in Thai tertiary education. The focus group discussion had been done with three sessions.

Session I: examine research findings from the first phase.

All 10 key informants had agreed with all stated subject areas. Five areas can be effectively related to ESD. However, some of them pointed out that social and cultures could be implemented sensitively due to the fact that they were altered by the contexts and locations including the uniqueness of each community. Moreover, they had got one consensus point that it was possible to integrate environment, social and cultures, economics, demography, and science and technology into ESD courses, and it is more effective if combined with the training in the utilization of technology to broaden the knowledge and practices.

Session II and III: Transdisciplinary Concepts of ESD and the blueprint for propelling ESD into higher education institutions in Thailand

According to the focus group discussion, there were eight elements required to help frame the establishment of holistic picture of Transdisciplinary Concepts of ESD, which can be at least combined into the development of ESD courses in higher education.

To start with the "Learning settings", the key informants shared their ideas that to achieve the goals of ESD, learning setting should not be a lecture based, instead the ESD courses should provide learners with the opportunity to experience the real fields as well as social and science laboratories.

Another vital element mentioned was "Learning Approach". The key informants recommended a variety of learning approaches to be implemented into the lessons such as PBL, STEAM, HANDS-ON, COOPERATIVE, OPEN-DOOR, VISUAL.

To clarify the details of each five subject areas, in environment area, learners should be educated facts, effects, changes, and solutions. For social and cultural area, history, community, laws, cultures must be integrated into the courses. Furthermore, ESD courses should provide learners with economics-related concepts such as a system, money flow, and management. In the area of demography, the relevant statistics should be included into the established ESD courses such as statistics and tendency of ones born, die, and move. Lastly, science and technology which include the aspects of agriculture, information technology, and engineering should be combined into the courses as seen in figure 2.

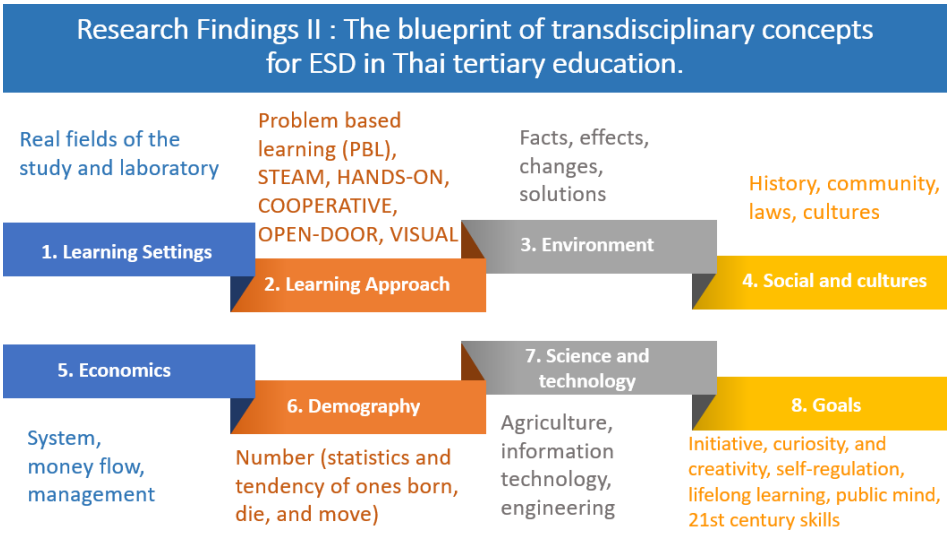

Figure 2 : Transdisciplinary Concepts of ESD

In conclusion, to develop the ESD courses for higher education institutions in Thailand, the concept of transdisciplinary must be encompassed. Five subject areas, environment, social and cultures, economics, demography, and science and technology, were significant key areas relevant to the goal of ESD, which aimed at promoting learners' initiative skill, curiosity, creativity, self-regulation, lifelong learning, public mind, and 21st century skills.

Discussion

This study aimed at surveying the development of ESD with the combination of transdisciplinary concepts and issued into the Thai curriculum. The research findings exhibit that all participants got a high score on knowledge and experiences in ESD, which was between 4.12 and 4.85. Moreover, 86 percent of the respondents selected science and technology as the priority subject area, followed by social and cultures, environment, economics, and demography, which were 73, 69, 65, and 62 respectively. Which is a reflection of the contemporary notion of action competence for sustainability because that is measurable as a competence of individual participants (Sass et al., 2020), composed of three distinct subconstructs – knowledge of action possibilities, confidence in one's own influence, and willingness to act (Olsson et al., 2016). In a previous study, we investigated students' experience of ESD in terms of the teaching approaches of holism and pluralism. In that study, it was found that ESD has an effect on students' knowledge about the prerequisites for sustainable development and on their self-reported sustainability behavior (Boeve-de Pauw et al., 2018). However, the integrated nature of today's sustainability issues, so-called super wicked problems (Lambrechts, 2020), requires citizens to not only have knowledge and skills to display certain sustainability behavior, but also to have the competencies to act upon these wicked problems.

Another research objective is to create a blueprint of transdisciplinary concepts for ESD in Thai tertiary education. there were eight elements required to help frame the establishment of a holistic picture of Transdisciplinary Concepts of ESD, including learning settings, learning approaches, environment, economics, demography, social and cultures, science and technology, and goals that can be the core concepts for the blueprint of Transdisciplinary Concepts of Education for Sustainable Development (ESD) in Thai Tertiary.

In Thailand, design education has attempted to intensify its focus on sustainability over recent years and a range of sustainable design initiatives have been carried out in order to contribute to the learning of design for sustainability. But, there is still a very limited amount of literature and learning resources available in the Thai language. The insufficiency of educators with qualifications and experience concerning sustainable design also greatly contributes to this dilemma. As a result, design for sustainability is usually just an elective or optional course at the undergraduate level and only taught in a limited number of universities. Regardless of its effectiveness, lecture-based learning is mainly employed to teach sustainable design principles, in order to encourage students to implement these principles into their design ideas. In the programs that do not offer such separate courses, sustainability is occasionally incorporated as an extra aspect of the studio experience. It is therefore important to have a blueprint of interdisciplinary concepts for ESD in Thai higher education.

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Fostering Excellent Young Generation for Creating A Brighter Future: Challenges and Inhibiting Factors

Putu Ayu Asty Senja Pratiwi, S.S., M.Hum., Ph.D

Udayana University, Bali-Indonesia
senja_pratiwi@unud.ac.id

Abstract

Youth have the creativity, the potential, and the capacity to make change happen – for themselves, for their communities, and for the rest of the world. They can be the agent of change, drive social innovation, the leader of the future, and many more. When the young generations are provided with the knowledge and opportunities they need to thrive, they can be a positive force for countries' development. However careful treatment and action to handle them are needed because when destruction and disturbance happen, the future of the nation will also be in danger. For those reasons, fostering the next generation is important to prevent them from taking the wrong path in their life which resulted in destroying their future and destroying the nation as well. This article is to shed light on the challenges and inhibitions in fostering the young generation. In addition, the contribution from Udayana University as one of the educational institutions in Bali Island, Indonesia to foster the young generation is also inserted.

Background of the study

According to the World Youth Report (2018) as cited in https://en.unesco.org/youth approximately 16 percent of the global population or reaching 1.2 billion goes to young people aged 15 to 24 years. By 2030, it is predicted it will be grown by seven percent to nearly 1.3 billion as targeted for sustainable development. With the big number of the young generation, it is important to enhance their knowledge, skill, and leadership, as in the future the role of the young generation will determine the country's path. To be a future leader is not taken by granted but a combination of hard work, conviction, and instinctive strategy which needs to be developed and nurtured.

Having a large number of young generations on one side is a blessing but also challenging. According to Chicca & Shellen-barger (2018b); Twenge (2016) today's young generation are the most open-minded, inclusive, and the most technologically savvy. They learn differently and have a unique worldview that differs from preceding generations. Youth have the creativity, the potential, and the capacity to make change happen – for themselves, for their communities, and for the rest of the world. Young people can be the agent of change and they also can drive social innovation, as part of the development of their societies. In the bigger picture, their existence can help the government to eradicate poverty and inequality, and foster a culture of peace. But we also need to be careful because the young generation is the leader in the future yet once destruction and disturbance happen in their life, the future of the nation will also be in danger. For those reasons, fostering the next generation is essential in order to prevent them from taking the wrong path in their life which resulted in destroying their future and destroying the nation as well.

Fostering the next excellent generation is one way to prepare the countries' future leaders who can lead and build the countries into a better situation in the future. When the young generations are provided with the knowledge and opportunities they need to thrive, those big numbers of young people can be a positive force for countries' development.

Based on the background, this article is trying to find out how to foster the next excellent generation, the challenges and inhibiting factors in fostering the young generation, and the contributions of educational institutions to foster the young generation. Those questions will be discussed in more detail in the next section.

How to Foster the Young Generation

To foster the young generation, firstly, their characteristics must be understood. The young generation has several features that differentiate them from the previous one because they were born in a highly developed digital era. Considered as the "net generation", they are comfortably living in a high-tech world, looking for changes and challenges, a bit impulsive and impatient, rather practical and problem-solving is done through the help of the internet (Bencsik, et.al, 2016). According to Hakam, et.al (2016) the characteristics that the next generation should have to be a future leader are: having emotional intelligence, friendliness, confidence, forthright, responsible, energetic, and ethical. Besides that, they must also have honesty, integrity and understand the philosophy of life.

To equip the young generation with the skills to persevere, courage and to prepare for the workforce conditions, some efforts may be conducted by the young generation themselves with the support of their family, friends, and surrounding.

Family is a fundamental factor that contributes to child development. For a child, family is the first social and educational environment. In fostering the young generation, family holds the most important role compared to other aspects of the children's life because each family member has a continuous and reciprocal influence on one another throughout development. Telzer (2017) mentioned as the closest bloodline, family impacts the attitudes, behaviors and affects the way the young generation think, behave, and make decisions and also influence expectations, needs, desires, and goals. Telzer (2017) added, parents' engagement in their children's intellectual activity -especially their education development- will result in children's high academic competence and school achievement. In addition, parent-child relationship quality, closeness, and trust with parents affect the young generation and could predict their academic competence, engagement and achievement and it may also decrease the depressive symptoms of teenagers.

Besides family, educational institutions such as schools and universities are the second most important places for the young generation to gain knowledge, develop their character and mentality. Education is an important tool to develop the ability to be available in developing countries in various fields. One kind of strategy that may be given to foster the young generation is to engage them in higher-order critical thinking through *Problem-Based Learning* (PBL). It is a strategy to build critical thinking skills and opportunities to enhance perseverance. The core of PBL activity is to make the young generation discuss in groups and give them the latest issue and work-related issues, ask them to analyze a problem, identify relevant facts, and let them apply existing knowledge and experiences to solve a problem. By brainstorming and discussing with their friends in the PBL class the young generation can ask a question, analyze problems, synthesize, interpret, infer, reason, apply, and use intuition and creativity. PBL also may involve clarifying concepts, prioritizing problems, identifying what is known and what is not known, examining assumptions, assessing different viewpoints, identifying possible interventions, examining alternatives, and reflecting on the process. Engaging the young generation to do PBL may employ constructivist principles to foster the application of prior knowledge, collaborative learning, and active engagement. By letting them explore the problem and let them find the resources and through self-directed information seeking they can expand their critical thinking and problem-solving, so their dependency is lower and become more independent.

Besides giving PBL, raising intellectual discipline is also important for the young generation to expect and anticipate challenges and failures in their career. Discipline to manage their time, life, money, and plan for their future. By making a future plan the young generation can prepare from the beginning what they expect to come in their life and try to make a mental preparation of how to solve problems encountered.

As teachers, dealing with the young generation who have different characteristics compared to the previous one requires patience and a specific way. It is highly recommended to teach them to recognize and

boost their potential. In addition, teachers should not force the potential that they are not passionate about it. For example, if they are not interested in science do not push them to do something that they do not like. It will lower their motivation and they will become reluctant to continue their study.

In addition to family and schools, education which comes from the environment is also influential for fostering the young generation. As an eastern country, Indonesia upholds ethics and morals and is also rich in culture and awareness of the value of wisdom. Indonesian people hold core cultural values tightly and local wisdom is a weapon to foster the next generation. Local wisdom suggests cultural identity in the local as well as knowledge of local constructive party ideas to take advantage of people to sustain their livelihood in the society. Local wisdom is the knowledge that is appropriate to be used in the development of countries to ensure national development to be more efficient (Pornpimon et al. 2014). Local wisdom is a combination of knowledge and traditions that are specific to a location, and that are passed on from generation to generation. The examples of local wisdom in Indonesia that are beneficial to foster the young generation is the spirit of togetherness, tolerance, and mutual cooperation. By having those local wisdom, the young generation can work hand in hand together to build the country and bring prosperity and peace to the people.

In addition to the local wisdom, Indonesian have *Pancasila* or the five moral principles to be implemented in everyday life. The first principle is the belief in the one supreme God. The second principle is just and civilized humanity. The third is the unity of Indonesia which means every action, expression, and behavior should aim to strengthen unity. The fourth principle is democracy led by the wisdom of deliberations among representatives, which is about responsible democracy and consensus-based decisions that represent the people. The last is social justice for all Indonesians. *Pancasila* is a strong weapon for the Indonesian to build and foster the next generation. With those principles we prepare the young generation with the cultural value, ethics and etiquette, and teach them to always be grateful, to embrace life, to be low profile, and respect others. Ethics and etiquette are very highly regarded in community life, especially in the attitude of a leader.

Challenges and Inhibiting Factors

Today's generation has been affected by the times and technology and has a different perspective and mindset that may not be understood by other people especially those who have the generation gap with them.

The young generation can be called the unlimited generation. Unlike the old generation, they have the freedom to express their mind, the master of Information and Technology (IT) and their creativity are limitless. With the big numbers of the young generation, we may feel relieved that the future of our world is guaranteed due to their existence. However, whether the world will become a better place to live or whether it will ruin, the answer depends on how the next generation will bring the nation in the future. There are challenges and inhibiting factors in fostering the young generation. As a consequence, careful treatment should be given to them to prepare them in facing the challenges that may occur in the future.

Challenges: Parental Education

Societies in general, and educators, in particular, consider that family and parental involvement are the main factors responsible for many successes but also for many ills in education today (Porumbu & Necúoi, 2013). They then added that in terms of parenting style, a number of studies have also indicated that authoritarian and permissive parenting styles are associated with low academic achievement and higher levels of school problems. This is the challenge that needs to be solved if we want to create the young generation as the next leader. To be a leader, the young generation needs to have the skill and potential to be a decision-maker and the permissive parenting style will make the children timid to take risks to decide something and try to find a solution by themselves.

Parents' worries and possessiveness are also bad ways of parenting teaching styles which can harm the young generation. In this case, when the parents are too careful and protective of the children, they do not have

time to learn something new and experience something without the help of their parents. This will then result in excessive dependency on the parents and children's lack of freedom of speech and expression.

Another parental style that often occurs especially in metropolitan areas or in families with low or difficult economic situations is the lack of attention and love from parents to their children. Often, the children will have problems with confidence and mental illness and may engage in dangerous behaviors due to thirst for attention.

Challenges : Education

To foster the young generation, we cannot only lay the responsibility on family, schools as a place for the student to gain knowledge also need to improve their quality. The government and the board of education should empower teachers and emphasize teachers' participation in giving the main decisions of school because teachers are the only people who are close to students at school and fully familiar with their interests, demands, and psychics. This is why teachers' welfare should also be raised to motivate them in educating the students and giving them a proper income that is balanced with their hard work.

Education system is managed by different methods throughout the world; including centralized, semi-centralized, and decentralized methods that are administered through different systems. Many countries with rapidly growing youth populations are struggling to educate their young people. The education systems of many countries are leaving behind a substantial proportion of the population. According to the most recent data available, in 32 countries, fewer than 80 percent of 15-24 year olds are literate (UN, 2015). Those are caused by the uneven education system and facilities experienced by the people in different areas. Inadequate investment in the education of young people limits their ability to reach their full productive potential and contribute to economic development. Rapid growth in the number of youth further compounds that challenge, requiring countries to improve the quality and reach of their education systems not only to make up for existing deficiencies but also to serve the rapidly growing number of young people. People in rural areas may not have the same access to education as those who live in the metropolitan area. In some parts of the world, girls and young women do not have the same access to education and training as their male peers. According to World Sex Ratio 2021 (www.StatisticsTimes.com) the percentage of women population in the world is nearly 50%. This means that empowering women and girls and ensuring equitable investments in their human capital are also essential for fostering the young generation. The government cannot only focus on men but also on women as well, to create the next excellent generation. If both men and women are provided with equal and sufficient education, training, and jobs, then the growth in their numbers could be highly beneficial for development.

Another challenge is the inadequate human capital investment and high unemployment rates among youth (United Nation, 2015). That impedes social and economic development and does not just for today but also for the future since youth who experience a delayed start in the labor force tend to continue to lag behind in terms of earnings and income growth once they become employed. The later the younger generation is trying to get a job, the more competitive the situation they will face and the competition will become tighter.

Besides the challenge that occurs from parental education and school, the environment provides its own challenge in fostering the next generation. Peer influence has predominantly negative connotations and received the most attention in the context of problem behaviors during adolescence. Indeed, extant research has shown that hanging out with the wrong crowd may increase deviant behaviors through processes of social reinforcement or "peer contagion" (Telzer et.al, 2017).

Inhibition

Externally, parental education, school, and the environment caused a big challenge for fostering the young generation. In addition to the external factors, the other factors that inhibit the fostering of the young generation comes from the children internally. The inhibiting factors can be seen as below:

1. Lack of awareness of future problems
   The first inhibition that surely will harm the young generation is when they pay less attention to specifically their lives and generally to their surroundings and to the world's future. What makes it worse is when they are not concerned about what comes in the future, do not prepare well for their future, and absorb more on their individual matters. The problem may also come when they do not have any definite future ideals and the lack of self-preparation for their future plans.
2. Lack of consciousness of the importance of knowledge as the provision for the future.
   The young generation lack consciousness and awareness that knowledge makes life easier prevent them from being prepared for their future.
3. Waste lots of time and lazy to act for good
   Wasting time shows laziness and it will lessen the young generation's productivity and creative thinking.
4. Choose wrong friendship
   Friends are one of the factors that shape one's personality. Young generations usually express their emotions more and are not stable in controlling their emotions. They will be easily influenced by other people, especially their friends. When they choose the wrong circle of their friends and community could result in a wrong future.
5. Reluctant to leave their comfort zone.
   Comfort zone is a comfortable place to live in. But if the young generation stays for a long time, they may lose their struggle and may be unwilling to leave it to experience new things outside of their comfort zone. Experiencing some trouble is a good exercise to practice our skill and mentality. When the young generation are reluctant to leave their comfort zone, they will lose all chance to be a better person in the future.
6. Too absorb in gadget
   As a form of technology and telecommunication development, gadgets offer sophisticated features that on one hand make people's life easier but on the other hand harm people especially the young generation if they cannot filter what they can see and get from their gadget.
7. Lack of support from family and the surrounding
   Besides our own effort, support from family and the surrounding is important to do good and big things for society and other people.

Despite the challenges and inhibiting factors that exist, effort should always be conducted to reduce the threat and potential danger in the young generation. As mentioned earlier that educational institutions are an important aspect in fostering the youth, this article also tries to explore the efforts and contribution from a university in Bali Island, Indonesia in fostering the young generation.

The Contribution of Udayana University Indonesia to Foster the Young Generation

Udayana University is the biggest and the oldest public university in Bali. It was established in 1962 and has become the foremost higher education in Indonesia (www.unud.ac.id; https://worldofstudents.org/auslandsstudium/Indonesien-Udayana-University-Denpasar/). It has 13 faculties and more than 30.000 students from all over Indonesian archipelago and also overseas. Most of the international students come from Asia, Europe, and Australia. There is also a small percentage of students who come from America and Africa. It is an internationally recognized university and in teaching and research activities it has strong links with local and international institutions. Udayana University seeks to be a leading university that produces high potential graduates who become the best in their generation. As the vision of Udayana University, the graduates are expected to become excellent, self-reliant, and culture-oriented. Udayana University emphasizes that they are producing the next young leaders with modern thinking and they have to be engaged with the local indigenous knowledge and practices and do not leave behind the socio-

culture aspects specifically in Bali and in Indonesia generally. Based on the university vision, it is clearly explained that even though the university and the graduates are well-known, they have to be engaged with the local indigenous knowledge and practices and do not leave behind the socio-culture aspects specifically in Bali and in Indonesia generally.

Udayana University does not only focus on the academic sector but also encourages the students to be active in the non-academic sectors. Having a big number of students from all over the globe, raise Udayana University's awareness to accommodate the growth of the students and support the activity beyond classrooms through Students Activity Units. It is an extracurricular student association that is implemented at the university level. In Udayana University there are 26 Students Activity Units that can be participated by Udayana University Students which are divided into several areas such as Sports (Wushu, Football, Futsal, Basketball, Badminton, *Merpati Putih Pencak Silat* (Indonesian martial arts), *Perisai Diri Silat* (Indonesian Martial Arts), Gateball, and Taekwondo); Leadership (Students' Military Training and Youth Scout); Humanity (Red Cross); Welfare (Coop Shop and Young Entrepreneur); Science and Technology (Robotic, Science Club, Agriculture and Related Science Association, Debating Club, Innovation and Electricity Car Club); Information and Communication (Press Academic and Udayana Focus), Art and Culture (including dance, singing, choir, both traditional and modern, theater groups, and Marching Band); and Natural Conserver Club is for those who concern with the natural being, preserve the nature and promote natural education.

Udayana University supports and opens a wide opportunity for the students to choose the Students' Activity Unit based on their interests, talents, and passions. Even though each unit has its own purpose, generally the aim is to expand and foster the students' knowledge and creativity beyond disciplines, socialize, gain experience, be more independent and work in a group, become more responsible, develop the potential of each member, and improve students' soft skill. The existence of those Students' Activity Units is also part of fostering an excellent young generation because the students are not only asked to learn academic knowledge but also other life skills that will be beneficial for them in running their life. Overall, Students' Activity Unit is a great place for the students to develop their potential, leadership skills, and learn life knowledge that is not obtained from the lecturer in the classroom. In addition, the Students' Activity Units is a vessel for the students to discover their own potential and sharpen their soft skills relevant to their interests and talents.

Conclusion

Family, education institutions and the surrounding are important factors to empower, support, promote, and ensure the recognition and visibility of the young generation. It is essential to identify the force, creativity, energy, know-how, and capacities of young people. We also have to recognize and find out the needs of the next generation so we can prepare how to handle them. Challenges and inhibitions to foster the young generation will always exist; however, advances in modern science and technology coordinated with family support, and education help to foster the young generation.

Balancing modern and traditional values is also a way to foster the young generation. Local wisdom and *Pancasila,* the five moral principles in Indonesia also help to prepare the young generation to face the next future era.

Students' Activity Units are also part of fostering an excellent young generation. It is a great place for the students to discover and develop their own potential and talent, sharpen their soft skill, leadership skills, and learn life knowledge that is not obtained from the lecturer in the classroom. In addition, it is also to expand the students' knowledge and creativity beyond discipline, socialize, gain experience, be more independent, learn other life skills that will be beneficial for them in running their lives, and prepare the young generation for facing their future careers.

In today's era, the challenges in life are tough. Eternity does not exist, while change is eternal. Change can happen rapidly and it takes active participation and role especially the young generation to adjust to the

situation. To survive means we have to adapt to the change and be part of the social change in our community. The young generation should not sit passively without doing any action or else they will be left behind and oppressed by others. They need to bear in mind that the future is much tougher than today and they are required to be creative, innovative, independent, confident, and control their emotions. The young generation must be aware that knowledge makes life easier. The development that occurs in nowadays era helps people to facilitate their life. To be able to take advantage of the progress, knowledge is needed. The young generation should be able to differentiate the good and bad things and should not become lazy to act good for our surroundings.

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Fostering Youth Geospatial Literacy in Indonesia through OLGENAS International Geolympiad

Avra Abida El Ravi[1], Febriyanti Paramesthi[1], Gonxha Bojaxhiu Obed Setiabumi[1], Dyah R. Hizbaron[1]

1.Faculty of Geography, Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract

For the last 17 years of its operation, OLGENAS International Geolympiad has been achieving numerous accomplishments, one of which is providing a wider distribution of Olympians, consisting of Indonesian participants and those from abroad. The wider scope of OLGENAS participation indicates that this event has played an active role in accelerating geospatial literacy, not only regionally but also globally and targeting different levels of generation, ranging from junior high school students, high school students, and university students. This event has also boosted the importance of spatial literacy for the public at large by holding a webinar, namely Geotalk. In addition, the substance of the test, which aligns with the international level, is another upgrade of OLGENAS in 2022. The materials of the Virtual Observatory Learning (VOL) sub-test at the 17th OLGENAS implementation in 2022 that are being delivered in a bilingual format, in Bahasa Indonesia and English, prove OLGENAS's commitment to constantly upgrade its quality.

A. The History of OLGENAS

One of the success indicators of Indonesia's development can be seen from the developments in the field of education. The presence of new competitions in the field of science demonstrates that the education in Indonesia has been gradually improving to reach a better level. OLGENAS is one of the geography competitions that accommodates young people who have an interest in the field of geography. The presence of OLGENAS has been influential in maintaining the existence of geography in Indonesia. This refers to the fact that this competition serves as a pioneer of the Geography Olympiad in Indonesia. In addition, today, OLGENAS has been widely known as a reputable competition in the community and became one of the geography olympiads that grabs the attention of the Indonesian youths.

OLGENAS is an annual competition held under the auspices of the Faculty of Geography, Universitas Gadjah Mada, which is known for its significant contribution for the community since 1963. As time goes by, this faculty continues to innovate and take part in the development of geography in Indonesia. Over time, the “Faculty of geography continues to play its part in the development of Indonesia. In its vision of becoming an international center of excellence in Geography towards sustainable development” the Faculty of Geography UGM seeks to increase students’ interest in Indonesia in geography as a way to enhance the reputation of the faculty to serve as the "center of excellence in Geography". OLGENAS has been a real hands-on implementation of this vision.

Firstly held in 2006, OLGENAS is the oldest and the first geography olympiad in Indonesia. In its first year, OLGENAS began to gain the public attention, especially students who are interested in the field of geography. In the following years, OLGENAS had started to gain a popular recognition and reputation as a prestigious geography competition in Indonesia. In fact, the implementation of OLGENAS has been adapted by some bigger olympiads, such as KSN (National Science Competition), which is held by the Ministry of Education in Indonesia and iGeo (International Geography Olympiad), a regular international competition.

Over time, OLGENAS has grown into a bigger event that constantly improves its quality to develop the olympics. Every year, OLGENAS raises actual issues in geography. On a national scale, OLGENAS has proven its success in carrying out the Olympics. For example, in 2018, more than

10,000 participants took part in OLGENAS. Despite this success, OLGENAS seeks to always increase its impact. In 2020, OLGENAS spread its wings by way of upgrading its scale to an international stage. For this purpose, OLGENAS was renamed as OLGENAS International Geolympiad and started to open up opportunities for international students to join this competition. The increasing level of this Olympics aims to help the young participants of OLGENAS to expand their network with those who share the same interest in geography, especially in geospatial literacy. Furthermore, OLGENAS seeks to accommodate more number of youths in the field of geography. This step proves that OLGENAS continues to monitor and contribute to develop science, especially geospatial literacy at an international scale.

The attempt of OLEGANS to reach an international stage by serving as an international broadcast of the Olympics has been positively responded by the public at large as it continues to spread its outreach.. By 2021, OLGENAS has been attended by more than 11.000 participants with more than 1000 teams from all over Indonesia. This enthusiasm is a sign that the existence of OLGENAS has a good impact on the community.

OLGENAS 2022 has been held on January 17-21, 2022. OLGENAS 2022 was entitled “Power of the Future: Renewable Resources as a Stabilization Instrument towards Global Security”. In 2022, OLGENAS made another achievement with the work of participants from abroad. With this, the name and influence of OLGENAS has expanded to other countries. OLGENAS has been designated as one of the best geography competitions in Indonesia and even in Southeast Asia. With this wider reach, OLGENAS is expected to be able to maintain the existence of geography and increase geospatial literacy for the young generation.

B. Scope and Purposes

It is important to develop one’s ability to think and analyze issues spatially. Spatial thinking refers to the geospatial concept, which allows a problem to be solved in a more concise and effective process. In particular, issues that are found on a daily basis related to a scale can be solved through a geospatial approach that includes aspects of location, magnitude, and orientation (Golledge, et al, 2008).

The effort to obtain the knowledge of geospatial sphere will determine the quality of geospatial literacy among the youth. Geospatial literacy has become the basis to understand the complexity of geospatial data. Spatial understanding, which is closely related to the study of geography with its focus on the usage of space, will thus be accomplished through the ability to identify a spatial pattern. That said, the youths are expected to come with expertise in understanding the pattern of both regularity and irregularity of every phenomenon.

Faculty of Geography of Universitas Gadjah Mada has consistently taken part in actualizing its commitment to designing a more competent and innovative generation of youth. The Faculty of Geography UGM as the education institution constantly holds OLGENAS International Geolympiad, as an annual event that provides a space that upholds youth's passion for the study of geography. OLGENAS has been presenting a variety of themes in the spatial field.

In the last three years since OLGENAS expanded its scope and substance of participation from a national to an international level, it always raises some interrelated theme. 2020 began the year with OLGENAS being an international level olympiad held with the theme “Welcoming E-Sphere: A New Way of Thinking Spatially ". 2021 was the particular year when OLGENAS presented the theme “A City for All: Elevating Urban Inclusivity and Livability for a Sustainable Future ". These are the evidence of OLGENAS's commitment to excellence in the quality of spatial understanding among the youth. This was put into action by choosing the implementation of the spatial concept as the theme for OLGENAS 2020 and being carried on in the theme of urban space and future sustainability for OLGENAS 2021.

Figure 1. OLGENAS International Geolympiad Theme Series during the last three years

Recognizing the urgency and importance of youth's role in understanding the acceleration of climate change, in 2022, OLGENAS appears with the theme *The Future Power: Renewable Resources as Stabilizing Instruments towards Global Security*. Through this theme, OLGENAS aims to build awareness among the youth that all forms of development must align with the concept of environmental sustainability. Hence, renewable resources and their alliance to global security become the main focus of OLGENAS 2022.

Understanding the increasingly heated climate change at worldwide scale demands the maturity of a geospatial concept. With this in mind, it is expected that the issues being handled are identified precisely by way of providing appropriate solutions according the problems and the potential of the spatial study. The discussion of climate change then leads to the concept of renewable resources, which includes the objectives, uses, and applications. Proper and precise management of renewable resources will strengthen the stability of an area on a regional and global scale.

Pandemic as the unprecedented event that we currently deal with has made some sort of a change in our daily activities, one of which is the OLGENAS International Geolympiad. Nevertheless, the presented online concept of the olympiad in the last two years did not diminish the enhancement of the organizing committee in preparing the series of activities to make it as interactive as the offline concept of OLGENAS in the previous year. The latest annual theme presented by OLGENAS was evenly distributed in every series of tests, namely Written Test, Case Study, Multimedia Test, Laboratory Test, Observatory Learning, and Proposal Planning Presentation. The online concept of OLGENAS requires one of the sub-test to be renamed as Virtual Observatory Learning. However, the organizing committee has arranged a good presentation of the VOL concept so that the Olympians can understand the substance of the test even if it is carried out remotely.

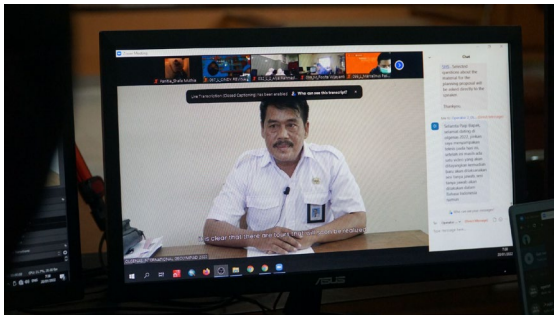

Figure 2. Presentation of the sub-test materials of Virtual Observatory Learning source: personal documentation

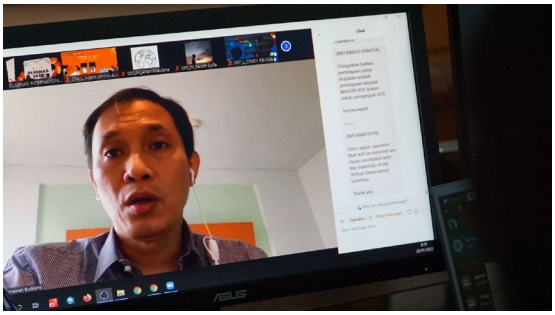

Figure 3. Presentation of the sub-test materials of Virtual Observatory Learning source: personal documentation

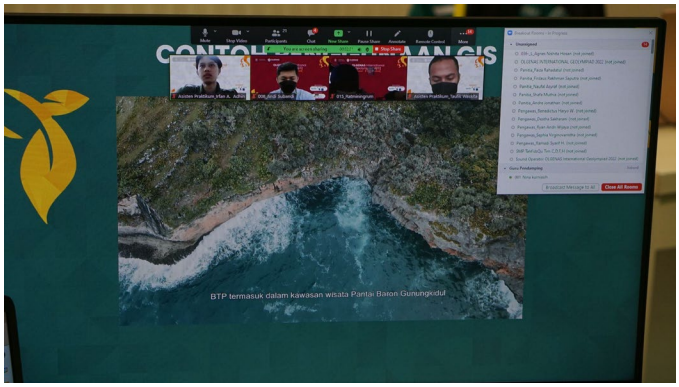

Figure 4. Sub-test session of Virtual Observatory Learning

OLGENAS 2022 came up with the theme of the management of renewable resources, which is implemented in every subtest, particularly on the VOL sub-test, which took place at Baron Techno Park (BTP) in Gunung Kidul Regency, The Special Region of Yogyakarta Province, Indonesia and Ancol Dam in Magelang Regency, Central Java Province, Indonesia. These two places shared the same focus of advancement, specifically on the use of renewable energy. Baron Techno Park focuses on developing renewable energy through the operation of wind power, while the Ancol Dam focuses on the utilization of water resources.

C. The Participants

OLGENAS International Geolympiad targets the younger generation as participants because they are Indonesia's asset for the future. OLGENAS provides a place for them to explore geography, especially geospatial literacy. It aims to increase the geospatial literacy of the younger generation because they have passion and ambition. The spirit of young people is expected to widely spread geospatial literacy and geography knowledge.

OLGENAS is divided into several events: OLGENAS for Junior High School, OLGENAS for Senior High School, and OLGENAS Scientific Paper Competition. The difference between this sub-competition is the segmentation of its participation. OLGENAS for Junior High School targets the participants with an age range of 11-15 years who are studying in junior high school. Meanwhile, OLGENAS for Senior High School is intended for high school students. Middle and high school students from all over Indonesia have the same opportunity to compete at the geography olympiad. In addition, the scale of OLGENAS' reach has shifted from national to international, which is proved by the opportunity for senior high school students from all over the world to attend OLGENAS for Junior High School and Senior High School.

OLGENAS for Junior and Senior High School participation is segmented for teenagers learning at the formal school. This is proven to be the right decision because along with the heightening competitiveness geography competition, OLGENAS will increase the younger generation's interest in geography and geospatial literacy. In addition, the target of participation will positively have an impact on the distribution of geographical knowledge for all junior and senior high school students from all over the world. This event seeks to increase the geospatial literacy of the younger generation.

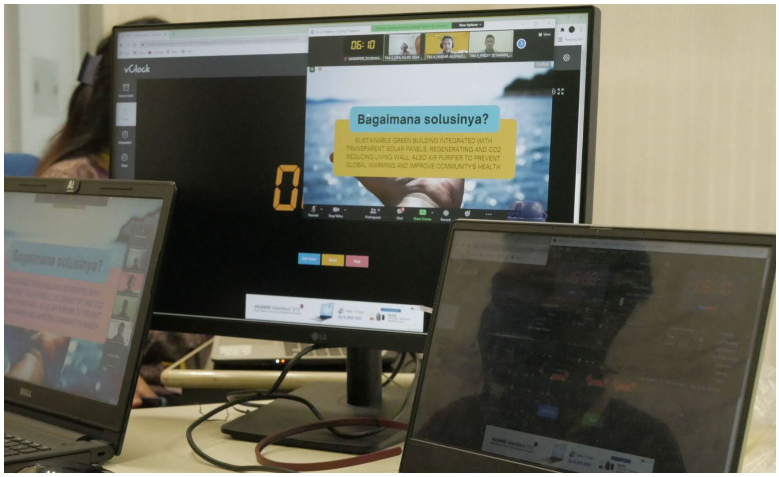

Figure 5. Final Presentation of OLGENAS Scientific Paper Competition 2022

OLGENAS Scientific Paper Competition is a sub-competition of OLGENAS, which has been held for17 years. OLGENAS targets undergraduate and diploma students from all over Indonesia to join this competition. With themes related to environmental issues, this competition urges students to actualize and apply the latest innovations they have designed for the progress of Indonesia. The selection of student segmentation will improve the geospatial literacy of the younger generation.

The younger generation is the agent of change. The vision for sustainable development must be implemented through the improvement of geospatial literacy. This competition introduces the younger generation to actual environmental problems. They can explore and understand the current ecological issues at stake in the world. Therefore, by introducing environmental problems to the younger generation, this competition helps the youths to explore these problems and to innovate to solve these problems. With this action, it is expected that future worldwide leaders will have geospatial sensitivity. It is hoped that the younger generation can build and lead the world by considering the ecological aspects of the environment. This way, the Indonesian and the global development can lead to sustainability as being promoted by all country leaders and the global community, through the Sustainable Development Program.

D. The Events and Achievements

The OLGENAS International Geolympiad 2022 has successfully been held for five days, from 17 to 21 January 2022. The events in those five days were divided into several different series: OLGENAS for Junior High School Students, OLGENAS for Senior High School Students, Supervising Teacher's Events, and the OLGENAS Scientific Paper Competition. This event was held under the theme **"The Future Power: Renewable Resources as Stabilizing Instruments towards Global Security"**

From 17 to 18 January 2022, OLGENAS for Junior High School Students was held in the form of olympiad competition about geography, and it was won by participants from SMPI Al-Azhar 8 Bekasi Team A. There was also an event for junior high school teachers consisting of TOURLAB, which was a Virtual Tour from the Laboratory of Faculty of Geography UGM, in addition to a

Workshop on the content of the work, which contained the link between the workshop output and renewable energy.

After the series of events for junior high school students and teachers lasted from 19 to 21 January 2022, there was OLGENAS for Senior High School Students, in which the Bulgarian National Team proved its victory. Similar to the previous series of events, high school supervising teachers also carried out several activities consisting of GEOCOURSE on Sustainable Development Goals (SDGs) in Indonesia and Focus Group Discussion on renewable energy. In addition, there was also a final presentation from the Scientific Paper Competition, which was attended by undergraduate and diploma students from various universities in Indonesia. A team from Gadjah Mada University won this competition.

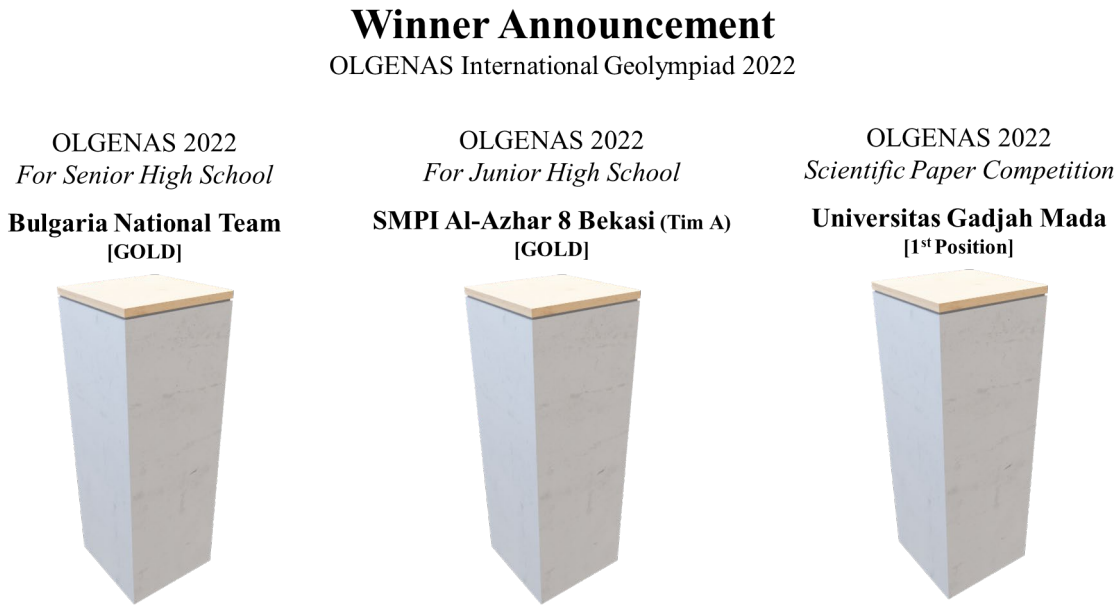

Figure 6. List of the First Place Winners of OLGENAS International Geolympiad 2022 for Middle and High School Levels and the 2022 OLGENAS Scientific Paper Competition

In addition to competitions and workshops, this year OLGENAS held GEOTALK as a talk show for the general public with the theme "Environmental Behavior Initiative: The Use of Alternative Energy as a Counterbalance to the Ecosystem." The event was attended by renewable energy experts, namely Alessandra Millican from Esri; Faela Sufa, MSc. Eng. from ITDP Southeast Asia; and Prof. Dr. Deendarlianto, ST, M.Eng. from the UGM Center for Energy Studies. In addition, this event attracted various participants, ranging from junior high school students to foreign students.

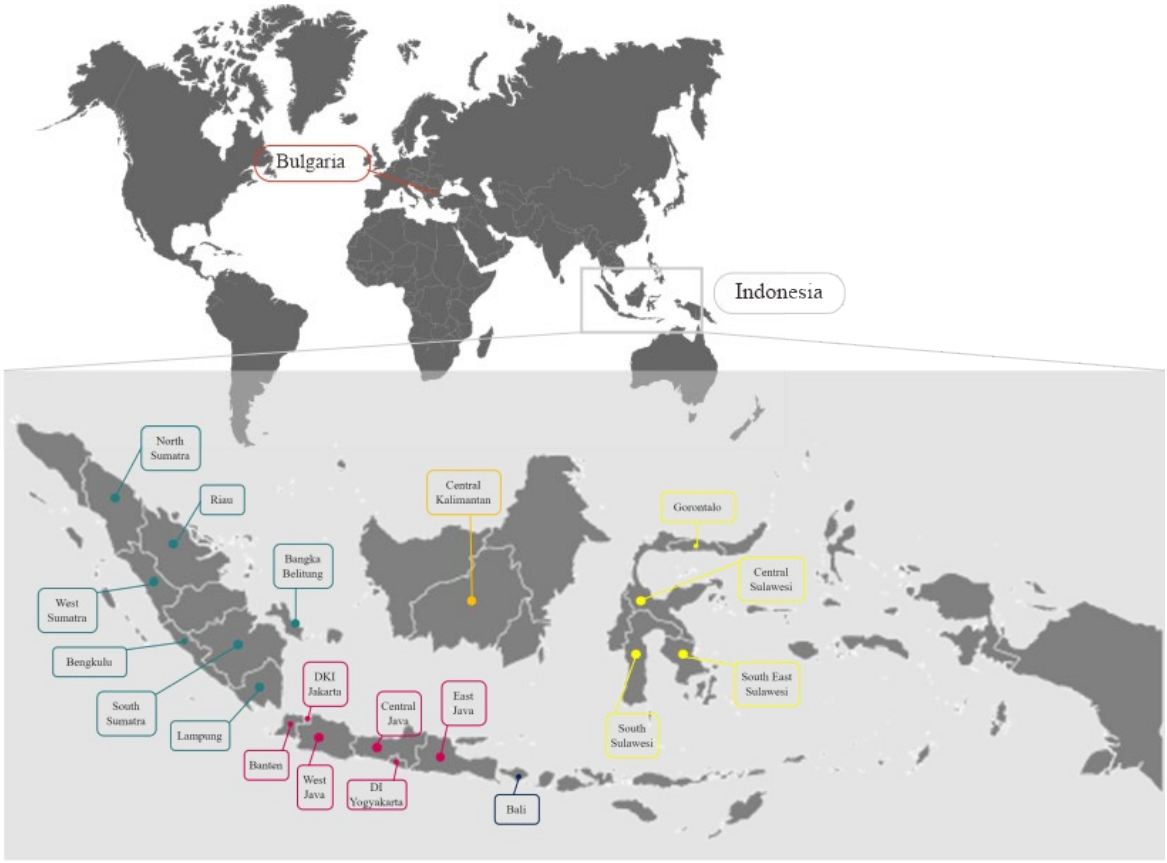

Figure 7. Participant Distribution of OLGENAS International Geolympiad 2022

The series of events in OLGENAS 2022 has achieved many accomplishments, one of which is the wide distribution of participants from abroad and all over Indonesia. In terms of Indonesian participants, many participants came from outside Java, such as Sumatra and Sulawesi, which indicates that the advancing quality of Indonesian education has reached the areas outside Java as the main economical and administrative center. In addition to showing an increase in the quality of education in Indonesia, the large number of participants in OLGENAS 2022 indicates that this event has increased global geospatial literacy and is targeting the younger generation at various levels, namely junior high school students, high school students, as well as university students, as well as the general public. This event also fosters geospatial literacy in the world community with Geotalk, a talk show about renewable energy.

The substance of this event also represents one of the achievements of Faculty of Geography of UGM as indicated by the excellent quality of the materials given at OLGENAS 2022, which proved the international quality of this event. In addition to the quality of the materials, the presenters and discussions in this series of events were highly engaging. An example of this was seen from the panel on the Virtual Observatory Learning (VOL), which discussed the Baron Technopark of Ancol Dam, delivered in two languages: Indonesian and English. This shows an increase in the quality of this event compared to previous years, which only presented a talk show in VOL in Indonesian.

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