Core-to-Core Programme Joint Seminar 2022

Bridging Ideas Between Asia and Europe for Promoting Education for Sustainable Development in Higher Education

Programme Book

Co-organized by University of Ljubljana, Slovenia and Okayama University, Japan
Supported by the Slovenian Research Agency (SRA), Slovenia and
Japan Society for the Promotion of Science (JSPS), Japan

14-17 September 2022, Ljubljana, Slovenia

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA IZOBRAŽEVANJE, ZNANOST IN ŠPORT

JSPS
Core-to-Core Program
FY 2021-2024

Welcome Message

Dear colleagues and guests,

We are all very pleased that we managed to organize the face-to-face joint seminar **"Bridging ideas between Asia and Europe for Promoting Education for Sustainable Development in Higher Education"**. In today's conditions (e.g. covid-19), this is an organizational challenge in itself. We are also pleased with the very large participation of our colleagues from distant Japan and the response of the invited speakers who will enrich the event with their thoughts. Special thanks to Dean Professor Dr. Atsushi Takase, Professor Dr. Hiroki Fujii and their colleagues for very efficient collaboration in preparing the event and first research outputs.

Despite the geographical distance, we all have an important common goal: creating a more sustainable future and to discuss the role that tertiary education plays in this.

We wish everyone a very fruitful seminar in Ljubljana, Slovenia.

Sincerely,

Gregor Torkar, Ph. D.

Professor
Faculty of Education, University of Ljubljana
Slovenian Coordinator of the Core-to-Core Programme “Formation of Centre of Excellence to Promote Teacher Education for ESD: Towards Achieving the SDGs”

Welcome Message

Dear colleagues and guests,

I am very glad to see the successful launch of the Core-to-Core Programme Joint Seminar **"Bridging ideas between Asia and Europe for Promoting Education for Sustainable Development in Higher Education"**. The seminar, which is co-organized by University of Ljubljana, Slovenia and Okayama University, Japan with support from the Slovenian Research Agency, Slovenia and Japan Society for the Promotion of Science (JSPS), Japan, will be held at Faculty of Education, University of Ljubljana, from September 14th to 17th, 2022. On behalf of all participants, I would like to give special thanks to Dean Professor Dr. Janez Vogrinc, Professor Dr. Gregor Torkar and the seminar officers for inviting us and welcoming us to this august international forum.

The purpose of the seminar is to discuss recent progress of a whole-institution approach to ESD and develop good examples of the approach in order to mainstream ESD in all aspects of teacher education institutions. It is hoped that the seminar will encourage international cooperation in this field and stimulate endeavours in Asia, Europe and other regions.

I deeply appreciate your coming to share with us this unique, memorable experience in Ljubljana, Slovenia.

Sincerely,

Hiroki Fujii, Ph. D.

Professor
Faculty of Education, Okayama University
Japanese Coordinator of the Core-to-Core Programme "Formation of Centre of Excellence to Promote Teacher Education for ESD: Towards Achieving the SDGs"

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Ljubljana, 14-17 September 2022

Concept Note

1. Background

Education for Sustainable Development (ESD) occupies a prominent place in the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) adopted by the United Nations (UN). It is "a vital means of implementation for sustainable development" and "a key enabler" of all the SDGs, as affirmed by the UN General Assembly in its resolution 72/222.

Educators including teachers have a crucial role to play in this global pursuit of sustainable development through education. As UNESCO's new ESD promotion measure "ESD for 2030" recognizes, educators are "key actors in facilitating learners' transition to sustainable ways of life." They can facilitate learning for sustainable development.

Recognizing the critical importance of educators in the SDGs, Okayama University, the only UNESCO Chair on ESD in Asia, launched the JSPS Core-to-Core Programme (Type B. Asia-Africa Science Platforms) (FY 2017-2019). It established core research exchange institutions for ESD teacher education and their academic network in Asia and contributed to building the capacities of the next generation of researchers. Subsequently, the University obtained a grant sponsored by the Japanese National Commission for UNESCO (FY 2018-2019), and it developed the "Asia-Pacific ESD Teacher Competency Framework" and a guide for effectively disseminating the framework in collaboration with 34 institutions in 16 countries across the Asia-Pacific region and with the support of UNESCO Bangkok and Asia-Pacific Cultural Centre for UNESCO. The framework currently comprises a programme guideline for developing ESD teacher education in the Asia-Pacific region and its research and educational achievements.

On the other hand, University of Ljubljana has participated in the UNESCO/UNITWIN Network in Education for Sustainable Lifestyles and conducted various researches for promoting teachers' ESD competency in collaboration with 27 institutions in 18 countries in Europe. An academic journal edited by the University published a special issue on "Sustainable Development in Education" and reported fruitful results of research and practice on ESD (see CEPS Journal, 3(1), 2013). The University has energetically developed teacher education for ESD through various activities, including incorporating ESD into existing teacher training programmes and courses, a green campus, and a student club on sustainability.

The whole-institution approach, directly linked to the institution's organizational culture and the leadership and management of students and faculty staffs, is the key to mainstreaming ESD in all aspects

of teacher education institutions. This approach, however, has not advanced sufficiently in any teacher education institution worldwide, not just in Japan and Slovenia. As stated by UNESCO, achieving a breakthrough in mainstreaming ESD necessitates teacher education institutions to provide good examples of the whole-school approach.

2. Objectives

The overall goal is to organize an event that will promote the collaboration between University of Ljubljana in Slovenia and Okayama University in Japan, both of which have outstanding achievements in ESD teacher education in Europe and Asia-Pacific, respectively, and to develop good examples of a whole-institution approach in ESD teacher education.

Specifically, the event is also aimed to achieve the following objectives:

- To better understand how to incorporate sustainability and ESD into all aspects of higher education institutions, particularly teacher education institutions.
- To report on progress in the development, implementation, and evaluation of teacher education programmes and courses that is a critical component of a whole-institution approach to ESD.
- To train young researchers on how to align their academic research with sustainability and ESD to ensure the approach's continued development.

3. Expected outputs

- Reports on the successes and lessons learned from integrating ESD into teacher education programmes and courses, including a framework of indicators for evaluating such integration.
- Sharing information between young researchers on their research and its alignment with the overarching theme of sustainability, ESD and the whole-institution approach.
- Suggestions and recommendations for fostering environments conducive to transforming teacher education for sustainable development via a whole-institution approach.

4. Participants

The event will bring together approximately 50 participants onsite from University of Ljubljana, Okayama University, and other universities, as well as online participants from partner institutions in Asia, Europe, and other regions of these universities.

5. Tentative time, Venue and Programme

14 – 17 September 2022 at University of Ljubljana, Ljubljana, Slovenia
Day 1: Opening, keynote speech, research presentation, workshop, welcome function
Day 2: Invited speech, research presentation, Students seminar
Day 3: School visit, wrap up, food events
Day 4: ESD excursion

6. Deliverables

Participants have submitted the following document prior to the event.

Participant	**Deliverables**
Master course students	Poster Presentation
PhD students	Abstract and Poster and PowerPoint presentations
Professors and Keynote/Invited speakers	Abstract and PowerPoint presentation

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14-17 September 2022

Programme Schedule

The event will take place at the Faculty of Education, University of Ljubljana, Kardeljeva ploščad 16, 1000 Ljubljana.
University professors and graduate students from Asia and Europe who are interested in Education for Sustainable Development (ESD) in higher education, especially teacher education, will participate in this seminar either on-site or online.

Wednesday, 14 September 2022	
8:30 – 9:00	Registration
9:00 – 9:15	Opening Ceremony Room: 048 Moderators: Gregor Torkar (University of Ljubljana, Slovenia) and Hiroki Fujii (Okayama University, Japan) Opening remark by Janez Vogrinc (Dean, Faculty of Education, University of Ljubljana, Slovenia) Opening remark by Atsushi Takase (Dean, Faculty of Education, Okayama University, Japan)
9:15 – 10:00	Agenda 1: Keynote speech Room: 048 Moderator: Gregor Torkar (University of Ljubljana, Slovenia) ESD for 2030 – Updates on the implementation and way forward Jun Morohashi (UNESCO Headquarter, Paris)
10:00 – 10:45	Teacher education for sustainable development: Where do we stand and where should we go next? Daniel Fischer (Wageningen University, The Netherlands)

10:45 – 11:15	Coffee Break
11:15 – 12:15	**Agenda 2: Research presentation** Room: 048 Moderator: Hiroki Fujii (Okayama University, Japan) **17 Sustainable Development Goals in the curricula of the selected undergraduate study programs at the Faculty of Education of the University of Ljubljana** Gregor Torkar (University of Ljubljana, Slovenia) **Sustainability competence and general professional competence to teach ESD among Japanese pre-service teachers** K.F. Ardh (Okayama University, Japan)
12:15 – 13:30	Lunch
13:30 – 14:30	**Agenda 3: Poster presentation** Room: Entrance Hall Introduction to the PhD seminar by Janez Krek (University of Ljubljana, Slovenia) *Participants will present their research on posters and share their ideas.*
14:30 – 16:30	**Agenda 4: Workshop for all participants** Room: 048 Rooms: P044, P037 *Participants will gain a better understanding of ESD by taking part in one of the workshops: the science education workshop or printmaking workshop.*
18:00 –	**Guided tour of the city centre** *Participants will enjoy a guided tour in the centre of Ljubljana.*
Thursday, 15 September 2022	
8:45 – 9:30	**Agenda 5: Invited speech** Room: 048 Moderator: Karen Onodera (Kyoto Koka Women's University, Japan)

	ESD promotion of teacher education institutions in the Philippines: A collaborative transformation process Jestoni Babia (University of San Jose – Recoletos, the Philippines)
9:30 – 10:15	Strengthening quality and relevance in teacher education through integrating interdisciplinary approaches on ESD Robert J. Didham (Inland Norway University of Applied Sciences, Norway)
10:15- 10:45	Coffee break
10:45 – 11:30	Agenda 6: Research presentation Room: 048 Moderator: Iztok Devetak (University of Ljubljana, Slovenia) Green chemistry education and ESD initiatives Vesna Ferk Savec (University of Ljubljana, Slovenia)
11:30 – 12:15	Multicultural teacher education on ESD for 2030 reflecting the situation of the immigrant background students Tomonori Ichinose (Miyagi University of Education, Japan)
12:15 – 12:35	Nurseries of plant biodiversity and the seeds for sustainability in a seminatural environment in Okayama Taro Harada (Okayama University, Japan)
12:35 – 14:00	Lunch
14:00 – 17:00	Agenda 7: Students Seminar Room: 026, P038 Moderators: Janez Krek (University of Ljubljana, Slovenia), Iztok Devetak (University of Ljubljana, Slovenia), Toshinori Kuwabara (Okayama University, Japan) and Koji Miyamoto (Okayama University, Japan) Short presentations *Students will be divided into two groups, science education and social studies education, and will give brief presentations on their research. They will discuss how to incorporate ESD/GCED foundational ideas into their research and formal education.*
Friday, 16 September 2022	
8:00 – 13:00	Agenda 8: Secondary School Visit *Participants will visit an ESD-focused secondary school in Naklo and learn about whole-school approach initiatives on ESD.*

13:00 – 14:30	Lunch	
14:30 – 16:30	**Agenda 9a: Food event for Students** Room: P053, 026 *Students will work with each other to prepare and enjoy foods of each country.*	**Agenda 9b: Meeting for Professors** Room: 048 *Professors will discuss the whole-institution approach to promoting ESD teacher education.*
16:30 –17:00	**Wrap up and closing remarks**	
Saturday, 17 September 2022		
8:30 – 17:00	**Agenda 10: ESD excursion** *Participants will visit the scenic Lake Bled and will explore the surroundings, tour an island of the lake and tour to the castle from a sustainability perspective.*	

For online participants and presenters:

Topic: Joint seminar "Bridging ideas between Asia and Europe for Promoting Education for Sustainable Development in Higher Education"
Time: This meeting will only take place on the morning programme of the first and second day.

Join Zoom Meeting
https://uni-lj-si.zoom.us/j/97970600389

Meeting ID: 979 7060 0389

1. Keynote Speeches

1.1 ESD FOR 2030 – UPDATES ON THE IMPLEMENTATION AND WAY FORWARD

Jun MOROHASHI, UNESCO Headquarter, Paris, France

To accelerate the achievement of the 2030 SDG Agenda, UNESCO's Education for Sustainable Development for 2030 framework (ESD for 2030) was adopted in 2019 with underscoring the central role of education as a key enabler to achieve all SDGs. In May 2021, on the occasion of the World Conference on ESD, education stakeholders including over 80 ministers adopted the Berlin Declaration on ESD, and renewed their commitments to transforming education through implementing ESD. Ministries of education and environment as well as education and development stakeholders in all countries are invited to collaborate in fully integrating ESD into policies, learning environments, educator's development, youth empowerment and community action.

Framed by ESD for 2030, Member States are invited to develop their respective "country initiatives" as a long-term programme in support of the country's good quality education policy and practice, instead of as an ad-hoc/short-term project or activity. Currently, more than 60 countries have committed to the Country Initiative process. Teacher development is one of remaining gaps for many countries. UNESCO has carried some studies, and found that overall, environmental themes are included in policy and curriculum, but the implementation is still low on average. 47% of national curriculum frameworks of 100 countries made no reference to climate change. Nearly 95% of teachers believed that it is important to teach about climate change, but fewer than 40% were confident in teaching it.

In addressing the gap related to teacher capacities, higher education has a key role to play. First, as many higher education institutions are already showcasing, they can be pioneers in adopting a whole-institution approach, where sustainability is not just seen a guiding principle, but also a principle of action that is practiced in all areas of the University in research, education, and governance, social participation and campus operations. Second, they are the key institutions that train future teachers as well as decision-makers. HED are expected to create and put into practice sustainability-ready pedagogy and training. Third, higher education institutions are where many youth leaders are engaging in action as students. For many, it is their first interaction with social action and will help shape their vision and inspiration for the world. HED institutes should facilitate youth engagement and creativity in all spheres of education including the design of policies and programmes on education and sustainable development. Finally, higher education institutions can become hubs for sustainable communities by providing expertise and support to local initiatives – it is a space where many different sub-sectors of society, including business, local community, schools, etc. can meet and collaborate.

Keywords: ESD for 2030, Whole-institution approach, Teachers, Higher education

1. Keynote Speeches

1.2 TEACHER EDUCATION FOR SUSTAINABLE DEVELOPMENT: WHERE DO WE STAND AND WHERE SHOULD WE GO NEXT?

Daniel FISCHER, Wageningen University, The Netherlands

Strengthening the capacity of educators to implement sustainable development in teaching-learning settings is one of the priority action areas of the #ESDfor2030 program. The field of teacher education for sustainable development (TESD) has become a vibrant area of research and practice in the wake of the Decade for ESD as well as the Global Action Program in recent years, which has also begun to spill over into general teacher education. Because the field is so dynamically evolving and contributions come from very different disciplines, determining what characterizes TESD as a research area and what it has produced in terms of results is challenging.

This presentation draws on a recent project to take stock of the field and identify main achievements. Based on a systematic review of 158 research papers, five different types of inquiry could be distinguished as characteristic of TESD as an evolving research field: designing learning environments, understanding learner attributes, measuring learning outcomes, promoting systems change, and advancing visions for the field.

The presentation will introduce the five types of TESD research and illustrate their distinct approaches with innovative examples from recently completed and ongoing research projects. The presentation concludes with an outlook on where major innovation potentials for future work in the field of TESD lie to contribute more effectively to building the capacity of educators and reorient education systems.

Keywords: Teacher Education for Sustainable Development, TESD, Continuing Professional Development

2. Joint Research Presentations

2.1 17 SUSTAINABLE DEVELOPMENT GOALS IN THE CURRICULA OF THE SELECTED UNDERGRADUATE STUDY PROGRAMS AT THE FACULTY OF EDUCATION OF THE UNIVERSITY OF LJUBLJANA

Gregor TORKAR, University of Ljubljana, Slovenia

The main objective of the report is to present the main results of the analysis of the representation of seventeen Sustainable Development Goals in the curricula of the undergraduate study programs The Two-Subject Teacher, Special and Rehabilitation Pedagogy and Primary Teacher Education at the Faculty of Education of the University of Ljubljana, Slovenia, which, together with the University of Okayama, is implementing the bilateral project "Development of Indicator Frameworks for Whole-institution Approach in Teacher Education for ESD: Toward Achieving SDGs". A team of experts from various fields in the natural sciences, social sciences, and humanities working at both universities collaborated to create a list of keywords that define the seventeen Sustainable Development Goals. The content, goals, and literature of the curricula of all required and elective subjects were reviewed individually for each keyword. In the presentation we will highlight our first findings. Let me just highlight a few: the lowest number of hits for the keywords searched are for SDG1 and SDG7. The highest number of hits for the keywords searched are for SDG4, SDG11, and SDG9. When searching for keywords in the curriculum of the Special and Rehabilitation Education programme, there were the most hits for SDG 4; otherwise, this programme contains much less SDG content than the Primary Teacher Education programme or the Two-Subject Teacher programme. The Two-Subject Teacher programme dominates hits for majority searched keywords in all SDGs.

Keywords: SDG, curricula, outdoor education, environmental attitudes, social skills

2. Joint Research Presentations

2.2 SUSTAINABILITY COMPETENCE AND GENERAL PROFESSIONAL COMPETENCE TO TEACH ESD AMONG JAPANESE PRE-SERVICE TEACHERS

K. F. ARDH, Okayama University, Japan

Introduction: To develop an effective sustainability program for preservice teachers, there is a need to understand the status quo of the target audience. In this study, we assess the sustainability competence of preservice teachers through a semi-structured interview. **Methods:** We incorporated indicators from two frameworks into our interview schedule, the European Sustainability Competence and the Asia-Pacific ESD Teacher Competence Framework. Six students from the elementary school program, five students from the secondary school science teacher program, and eight students from the special education program made up the final sample size of 19 respondents. Data collection period was between May-July 2022. The interviews were conducted, recorded, and transcribed in Japanese. After translating the transcript into English, we assign a score based on the representation of the indicators. The maximum score is 100%, which indicates that every indicator is present in every response. We averaged all of the respondents' score based on: (1) domain, (2) demography of respondents (which program do they belong to); and (3) category indicators (knowledge, skill and attitude). We utilized descriptive statistics to explain all of the responses. **Results:** For all indicators, respondents from elementary, secondary, and special education courses scored similarly. When comparing sustainability competencies to general professional competencies for teaching ESD, respondents scored differently on knowledge and skill, but not in the attitude category indicators. The average respondent scored half or less on all indicators. Respondents scoring the lowest on the domain "Envisioning Sustainable Future", which include futures literacy (34%), adaptability (23%) and exploratory thinking (17%). **Discussions:** Based on the above finding we concluded that to improve the preservice teachers' sustainability competences through experiential learning that challenges to envision their desired future and explore ways to reach it. In the general professional competencies for teaching ESD, respondents demonstrated indicators of the teachers' competencies to develop themselves (Continue to learn and create) and connect with others (Connect, collaborate and engage). Further study is needed to determine whether this awareness is particularly evident in teaching ESD.

Keywords: Sustainability competence, General professional competence to teach ESD

3. Poster Presentation (Science Education)

3.1 CONTEXT-BASED PHYSICS CURRICULUM: COMPARISON OF JAPANESE AND BRITISH PHYSICS TEXTBOOKS
Takumi SHIBA, Okayama University, Japan

3.2 TRENDS IN SCIENCE LESSON PRACTICES ON INVASIVE ALIEN SPECIES: A SYSTEMATIC LITERATURE REVIEW
Tetsuya IDA, K. F. ARDH, Okayama University, Japan

3.3 IDENTIFICATION OF CLIMATE CHANGE EDUCATION (CCE) CONTENT IN THE JAPANESE SCIENCE CURRICULUM
Mako KOEDA, K. F. ARDH, Okayama University, Japan

3.4 PRIMARY SCHOOL SCIENCE LESSON PLAN ON INVASIVE ALIEN SPECIES (IAS) TO FOSTER FUTURE THINKING
Momoka SHIBUNO, K. F. ARDH, Okayama University, Japan

3.5 THE BANANA DILEMMA: UTILIZING INTERLOCKING NARRATIVE IN SCIENCE LESSON TO FOSTER FUTURE THINKING
K. F. ARDH, Hiroki FUJII, Okayama University, Japan

3.6 CHILDREN'S PERCEPTION OF INSECT FEELINGS: A SURVEY OF LOWER ELEMENTARY SCHOOL CHILDREN ENGAGED IN INSECT BREEDING
Karen ONODERA, Kyoto Koka Women's University, Japan; Hiroki FUJII, Okayama University, Japan

3. Poster Presentation (Social Science Education)

3.7 **DEVELOPING A LAW-RELATED EDUCATION PROGRAM BASED ON THE EXPERIENCES OF FAILURE -A CASE STUDY OF CONSUMER EDUCATION MATERIALS FOR HIGH SCHOOL STUDENT-**
Ayuha MIYAMOTO, Okayama University, Japan

3.8 **IN CITIZENSHIP EDUCATION BASED ON REGIONAL COLLABORATION SIGNIFICANCE AND ROLE OF COORDINATORS: HIGH SCHOOL INITIATIVE IN SHIMANE PREFECTURE**
Masatoshi HATANO, Okayama University, Japan

3.9 **MAKE THEM THINK ABOUT HOW TO LIVES AS CITIZENS: ELEMENTARY SCHOOL SOCIAL STUDIES UNIT DEVELOPMENT RESEARCH**
Yuka FUKUTA, Okayama University, Japan

3.10 **COMPONENT OF THE CITIZENSHIP EDUCATION IN THE CURRICULUM OF INTERCULTURAL STUDIES: THROUGH THE ANALYZING THE AUSTRALIAN NATIONAL CURRICULUM**
Natsuki NAGATA, Okayama University, Japan

3.11 **A RESEARCH PROJECT ON THE HIDDEN CURRICULUM FROM A GENDER PERSPECTIVE - FOCUSING ON TEACHER-STUDENT INTERACTIONS BY SUBJECTS**
WANG Heqiao, Okayama University, Japan

3.12 **JAPANESE LANGUAGE EDUCATION FOR FOREIGN TECHNICAL INTERNS-FOCUSING ON CITIZENSHIP AND CAREER DEVELOPMENT**-
Hoang Ngoc BICH TRAN, Okayama University, Japan

3.13 **PREJUDICE FROM CULTURAL DIFFERENCES: A CROSS-CULTURAL EDUCATION DEVELOPMENT COURSE**
HELIAN Ruyu, Okayama University, Japan

3.14 **DEVELOPMENT OF CITIZENSHIP EDUCATION PROGRAMS TO FOSTER ACTIVE CITIZENS - BASED ON COLLABORATION WITH THE LOCAL COMMUNITY**
Nagisa YAMADA, Okayama University, Japan

3.15 **PRACTICAL STUDY ON CREATING A PLACE TO CONNECT CHILDREN WITH FOREIGN ROOTS AND REGIONAL SOCIETY IN JAPAN: ATTEMPTS TOWARD A MULTICULTURAL COEXISTENCE EDUCATION IN OKAYAMA URBAN COMMUNITY**
XIE Xinyi, Okayama University, Japan

3.16 **STUDY ON THE PROGRAM OF DEVELOPING GLOBAL LEADERSHIP: FOCUSING ON THE REFLECTION PROCESS**
GAO Yu, Okayama University, Japan

4. ESD Workshop

4.1 THINKING CREATIVELY ABOUT ESD THROUGH PRINTMAKING

Zora STANČIČ, ALUO University of Ljubljana
Mojca ZLOKARNIK, Faculty of Education, University of Ljubljana

In the workshop, participants will get a deeper insight into artists' perspective on education for sustainable development. The artists will encourage the discussion and creative thinking of the participants through art.

4.2 PROBLEM-BASED RESEARCH WORK IN SCIENCE EDUCATION AS THE KEY TO LINKING DIFFERENT INSTITUTIONS

Miha SLAPNIČAR, Faculty of Education, University of Ljubljana
Tim PREZELJ, Faculty of Education, University of Ljubljana

The workshop will present an example of best practice - a research project in the field of science education that connects gifted students from the High School in Ljutomer and researchers from the Faculty of Education. The students will present the concept of the research project entitled "Wisteria toxins, a chemical and socio-cultural perspective", which, in addition to a short theoretical work, includes some concrete experiments that can be used to implement sustainable development. The participants of the workshop will be able to try different practical activities and experiments.

5. Invited Speeches

5.1 ESD PROMOTION OF TEACHER EDUCATION INSTITUTIONS IN THE PHILIPPINES: A COLLABORATIVE TRANSFORMATION PROCESS

Jestoni BABIA, University San Jose Recoletos, Philippines

The global framework for ESD implementation from 2020 to 2030 is Education for Sustainable Development (ESD) Towards Realizing the SDGs. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) has advanced ESD for 2030 based on the lessons learned from the Global Action Programme (GAP) on ESD in response to the growing emphasis on ESD to encourage the contribution of learning content to humanity's survival and prosperity. Furthermore, through transformative education, UNESCO seeks to orient and transform societies. Higher Education Institutions (HEIs) must provide students with the necessary information, attitudes, and competencies in order to reach the GAP for ESD. ESD approaches should be widely adopted at Philippine HEIs to solve economic, political, environmental, and social issues, particularly following the pandemic's detrimental effects. Since 2017, the University of San Jose-Recoletos (USJ-R) has been consistent in its support of transdisciplinary and transformative programs for unwavering commitment and innovation in learning to real evidence of sustainable growth among its students and community. USJ-R demonstrates the establishment of the ESD Promotion Center, which will aid in the achievement of the "Ambisyon Natin 2040" and the 2030 ESD target. The ESD Center interacts with various institutions, including UNESCO Bangkok and UNESCO Japan, as well as SEAMEO ESD Fellows at three HEIs in the Philippines, namely Cebu Normal University (CNU), Cebu Technological University (CTU), and Philippine Normal University-Visayas (PNU). To enable community master trainers in HEIs to carry out their community-based ESD work, the framework employs the six-priority action ESD principles and a participatory methodology. A series of ESD-based activities were carried out, including the Climate Change Education Summit among Visayas Region Centers of Excellence and Development, which exchanged vital research for climate change initiatives, notably in Teacher Education Institutions. Following the training of community master trainers to incorporate ESD into their respective community outreach programs, monitoring, evaluation, and research revealed that ESD implementation in the Philippines is currently at an average level, and that projects and curriculum initiatives must place a strong emphasis on beneficiary transformation through careful planning, monitoring, and evaluation. Student participation in HEIs must also be increased through Curriculum Quality Audit (CQA), in which ESD competencies, including the aims and standards of the 17 Sustainable Development Goals (SDGs), will be explicitly incorporated and mapped in the curriculum. This work should be replicated in the future with a focus on sustainability competencies integration in the curriculum and transformation research, monitoring and evaluation of ESD-based studies, and recommended strategies for a wide range of coverage influence and utilization, particularly for HEIs.

Keywords: Education for Sustainable Development, Curriculum Development, Curriculum Quality Audit and Higher Education Institutions in the Philippines.

5. Invited Speeches

5.2 STRENGTHENING QUALITY AND RELEVANCE IN TEACHER EDUCATION THROUGH INTEGRATING INTERDISCIPLINARY APPROACHES ON ESD

Robert J. DIDHAM, Inland Norway University of Applied Sciences, Norway

Over the past 6 years, the teacher education program at INN University has undertaken a number of efforts to integrate and strengthen approaches on interdisciplinary education throughout its courses and curriculum. This has focused on addressing three overarching themes framed in the Norwegian curriculum: sustainable development, citizenship and democracy, and public health and life skills. These three themes are framed in the core curriculum alongside the values and principles of the curriculum. «These three interdisciplinary topics in the curriculum are based on prevailing societal challenges which demand engagement and effort from individuals and local communities, nationally and globally». The efforts to strengthen interdisciplinary approaches in teacher education are linked directly to our overall goals to improve the quality and relevance of education; to better prepare are students for their future roles as teachers, and for their teaching to develop the skills and competencies in learners to engage with and address complex, real-world challenges like sustainable development. This project has implemented many innovative models and methods for active, interdisciplinary learning. It has also worked with the administrative procedures, the strategies and study plans, and it has engaged in capacity building with our teacher educators. In addition, the interdisciplinary work is helping to strengthen bridge between teacher education and schools, and we have developed active partnerships with our partner schools to further the work on interdisciplinary education during the student teacher's praxis period.

Keywords: Teacher Education, Interdisciplinary Approaches, Education for Sustainable Development, Quality and Relevance

6. Research Presentations

6.1 GREEN CHEMISTRY EDUCATION AND ESD INITIATIVES

Vesna FERK SAVEC, University of Ljubljana, Slovenia

Attempting to advance sustainable thinking in practise by engaging networks of chemists and stakeholders to develop Education for Sustainable Development are part of the 2030 Agenda framework, particularly the fourth Sustainable Development Goal, which aims to ensure inclusive, equitable and quality education and promote lifelong learning opportunities for all.

In integrating the Sustainable Development Goals into Green Chemistry Education, an interdisciplinary framework is needed to explore how cognitive, social and emotional factors interact to promote understanding of environmental issues and problems. As the development of green and sustainable technologies requires highly skilled professionals who are critical, systems-oriented and inter/transdisciplinary thinkers, the integration of sustainability and green chemistry into the education of future chemists and chemical engineers has been identified as important to ensure students are well positioned in the future labour market and in their social roles. The latter is also evident from the literature review, which provides several examples of good practises on how green chemistry has been integrated into their university curricula.

The literature describes different approaches to introduce students to the ideas of green chemistry, e.g., the integration of green chemistry into traditional chemistry teaching; the introduction of green chemistry into the curriculum; the integration of green chemistry into textbooks and other learning materials; the development of lectures, courses and Massive Open Online Courses in green chemistry; the use of different types of metrics to determine the 'greenness' of a chemical reaction; different types of experimental work related to green chemistry topics, supporting the development of students' systems thinking through the practise of green chemistry and the implementation of green chemistry to promote sustainable development using synergies between green chemistry and other environmental strategies such as Environmental Management System, Life-Cycle Analysis, Circular Economy and Industrial Ecology.

Although the important role of Green Chemistry Education of future chemists and chemical engineers in green chemistry is acknowledged, the literature review shows that green chemistry topics are rarely covered in primary and secondary education and in the training of future teachers. Therefore, the presentation will also try to address and discuss different possibilities in relation to these needs.

Keywords: Green chemistry, teacher education, students' experimental work

6. Research Presentations

6.2 MULTICULTURAL TEACHER EDUCATION ON ESD FOR 2030 REFLECTING THE SITUATION OF THE IMMIGRANT BACKGROUND STUDENTS

Tomonori ICHINOSE, Miyagi University of Education, Japan

The current crisis in Ukraine has created the greatest refugee surge to OECD countries. In March 2022, the United Nations estimated that nearly one Ukrainian students per second had become a refugee.

OECD (2015) has shown the performance gap between first-generation immigrant students and students without an immigrant background tends to be wider in reading than in mathematics or problem solving. This suggests that language barriers to text comprehension may be key in explaining performance differences between these two groups of students.

Silveira, F. (2019) has examined achievement from the 2015 PISA (Programme for International Student Assessment) in 41 high-income countries. The authors use within- and cross-level interactions to examine (1) the relationship between immigrant status and academic achievement, (2) the moderating effect of student socioeconomic status on achievement, and (3) how country-level foreign-born population affects both immigrant and native-born students' performance.

Although the academic performance of immigrant students globally is moderated by socioeconomic status, at country level a larger immigrant population affects the academic performance of both immigrant and native-born students. Nonetheless, language barriers may lead to performance differences between these student groups. In Japan, academic performance data have not been analyzed alongside student immigration status data.

However, in 2021 National survey on academic performance incorporate the question item about condition of speaking Japanese at home.

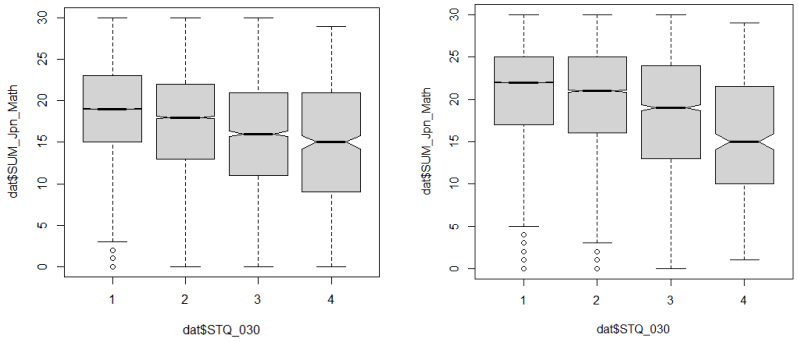
Therefore, this research assessed the performance of national language (Japanese) and mathematics of immigrant and native-born students based on the result of national survey on academic performance. This research also intends to assesses immigrant background (socioeconomic status: SES) and its effect on academic performance.

	Speaking Japanese at home	Elementary 6th grade	Junior High school 3rd grade
Group 1	Always speaking	855,659(85.1%)	832,223(89.1%)
Group 2	Almost speaking	119,304(11.9%)	66,408(7.1%)
Group 3	Sometimes speaking	25,442(2.5%)	23,948(2.6%)
Group 4	Never speaking	4,151(0.4%)	5,853(0.6%)
	others	832	246
	No answer	625	4,638
Total		1,006,013	933,316

Chart：National Academic Performance and Learning Situation Survey"How often do you speak Japanese at home?"

Teacher Education and mathematics was significantly higher than those given by students who sometimes or never speak Japanese at home. There was also a significant difference between the preference of students who always or almost always, and students who sometimes or never speak Japanese at home, in terms of national language. In mathematics, there is almost no difference between Group1 always speaking and Group2 almost speaking. No correlation was found between speaking Japanese at home and not speaking Japanese with SES.

The number of correct answers given by native-born students for national language Multicultural



Elementary Junior High school

Figure: The number of correct answers for national language and mathematics; Source: Author

Reference:

Banks and Banks, eds. (2019). Multicultural Education: Issues and Perspective, John Wiley & Sons.

OECD (2015). Helping immigrant students to succeed at school–and beyond. https://www.oecd.org/education/Helping-immigrant-students-to-succeed-at-school-and-beyond.pdf

Silveira, F., Dufur, M.F., Jarvis, J.A., and Rowley, K.J. (2019.) The Influence of Foreign-born Population on Immigrant and Native-born Students'Academic Achievement,Sociological Research for a Dynamic World Volume 5: 1–19. Volume 5: 1–19.DOI: 10.1177/2378023119845252

Keywords: Immigrant background students, Academic performance, Socioeconomic Status, Multicultural teacher education, Social Justice

6. Research Presentations

6.3 NURSERIES OF PLANT BIODIVERSITY AND THE SEEDS FOR SUSTAINABILITY IN A SEMINATURAL ENVIRONMENT IN OKAYAMA

Taro HARADA, Okayama University, Japan

Applied Biology, one of the major secondary science education courses in the School of Education, Okayama University, has been provided with intensive opportunities for biological field observations. In class B, students have learned not only about the morphology and ecology of plants, but they have also studied biodiversity in a seminatural environment in Okayama Prefecture. In rural areas, various kinds of weeds are found, some of which are globally invasive or alien species. Agricultural crop plants, including rice and peaches, and garden trees are also grown in abundance; many of these originate overseas. Artificial water environments, such as ponds, irrigation channels, and paddy fields, have been managed for rice cultivation; they function as habitats for four different types of aquatic plants (submerged, emergent, floating leaved, and free-floating) and many native or invasive alien animals. Hiigoike Wetland in Soja City was constructed in the 1990s by transplanting natural wetland soil surfaces endangered by highway construction. Students have learned that this seminatural wetland biotope successfully provides citizens and school students with a place to engage in environmental conservation activities and examine native wetland species and the ecosystem. In Handayama Forest, located near Okayama University's Tsushima Campus, a typical secondary warm-template laurel forest has formed. Native trees forming cones (gymnosperms) or acorns (angiosperms) and shrubs, some of which are given a scientific name containing japonica or japonicum, exhibit the stratification and succession of the forest. In addition, some kinds of ferns and mosses can be observed. Leaf morphology is one of the key points for identification of plant species from these diverse taxa. To verify the effects of these experiences on students' consciousness regarding sustainability, the short version of the sustainability consciousness questionnaire (SCQ-S) developed by Gericke et al. (2019) was introduced with the five-point scale. While most of the students majoring in natural science recognized the importance of biodiversity preservation in the preliminary question, changes in their consciousness tended to appear in some of the other items in the post questions. It was suggested from students' answers to the descriptive questions that their recognition of native and alien species had been updated and other experiences may also have influenced such changes. The trial partially showed the potential usefulness of the SCQ. Field observations of local plant biodiversity may cause one to reflect on knowledge regarding the relationships between the natural environment and humans. Further facilitation is expected to alter students' behavior toward the achievement of SDGs from scientific and global viewpoints.

Keywords: Plant biodiversity, Native/alien species, Rural area, Wetland, Forest

7. Student Seminar (Room A)

7.1 CONTEXT-BASED PHYSICS CURRICULUM -COMPARISON OF JAPANESE AND BRITISH PHYSICS TEXTBOOKS-

Takumi SHIBA, Okayama University, Japan

Introduction: Japanese students are generally uninterested in physics despite ranking high in scientific literacy survey. The probable cause of the disinterest is a lack of connection between the curriculum and daily lives. A Context-Based Physics (CBP) curriculum that emphasizes “concepts and process skills in real-world contexts that are relevant to student”, is a possible solution. To create a lesson that can engage the interest of students in physics, it is necessary to comprehend the characteristics of the CBP curriculum. **Methods:** In this study, five textbooks were compared: general physics textbooks from Japan (2) and representative CBP textbooks in the UK; Salters Horners AS/A level Physics (SHAP) (2) and Physics in Context for Cambridge International AS/A level (PIC) (1). **Discussion:** This study found that CBP textbooks are distinctive in terms of “chapter organization”, “approach”, and “activities”. Moving forward, we will implement the above findings from British CBP textbooks to develop an innovative physics lesson plan for Japanese high school students.

Keywords: Context-Based Physics (CBP), Textbook Comparison, Japan, UK

7. Student Seminar (Room A)

7.2 DEVELOPING ENVIRONMENTAL COMPETENCIES OF FUTURE CHEMISTRY TEACHERS THROUGH INQUIRY-BASED LEARNING

Katarina MLIRANEC, University of Ljubljana, Slovenia

Green chemistry with its guiding principles aims to reduce or eliminate the use or generation of hazardous substances in the design, manufacture, and application of chemical products. The set of principles therefore seek innovative solutions for cleaner processes and products to protect human health and the environment. The growing support of researchers for green chemistry especially over the last twenty years can therefore be understood as an expression of commitment to more benign and safer processes and products using renewable instead of fossil-based resources, with a view to their application linked to sustainable development efforts that encompass not only the principles of green chemistry but also other economic and social dimensions. Many different efforts and approaches to integrate green chemistry into chemistry education have been observed. However, there is still considerable potential and need to integrate green chemistry ideas more systematically into chemistry education, as proposals for its inclusion are often made in a superficial way, as an add-on or additional quality rather than as a specific objective. Moreover, studies on the integration of green chemistry into teaching and learning focus primarily on tertiary education in non-pedagogical study programmes, indicating that green chemistry also needs to be addressed in secondary and primary education, as well as in pre- and in-service teacher education, as chemistry teachers play an important role in developing students' understanding, as consumers and citizens, of the importance of chemistry in relation to sustainable development, and empowering them with knowledge and skills to address global challenges. For teachers to successfully incorporate green chemistry ideas into their teaching, they need to develop what is known as pedagogical content knowledge (PCK), which is based on how teachers relate their content knowledge (what they know about what they are teaching) and their pedagogical knowledge (what they know about teaching). The purpose of the study (still to be conducted) and the main objectives relate to investigating the integration of green chemistry into chemistry teaching and learning in Slovenian primary and secondary schools and proposing a framework for an online course in green chemistry for in- and pre-service teacher training.

Keywords: Teacher education, chemistry education, pedagogical content knowledge (PCK), online course, green chemistry

7. Student Seminar (Room A)

7.3 DEVELOPING ENVIRONMENTAL COMPETENCIES OF FUTURE CHEMISTRY TEACHERS THROUGH INQUIRY-BASED LEARNING

Luka VINKO, University of Ljubljana, Slovenia

Introduction: Due to the various environmental problems that we are dealing with as a society, it is very important to educate environmentally conscious or environmentally literate individuals with appropriately developed environmental competences. Chemistry teachers play a big role in this, as they directly address their students when teaching environmental content. In the education programs of future chemistry teachers, special emphasis should be placed on the development of their environmental competences. **Methods:** Our study will investigate the development of environmental competencies, specifically the understanding of content about the hydrosphere, in 50 pre-service chemistry teachers. In doing so, the learning process will be actively pursued with a specific laboratory activity (study material that will be developed in the first phase of the research and will be based on inquiry-based learning, in which an actual environmental problem about water pollution will be highlighted) and by measuring independent (eye movements, individual interest, working memory capacity, formal-logical thinking...) and dependent variables (situational interest, environmental competences). The research will be a combination of quantitative and qualitative research approach. Our data will consist of completed module, which will be analysed. questionnaires, audio, and video recordings of the implementation of the module, knowledge tests before and after the implemented module, data obtained with a portable eye tracker, which will be used to measure the focused attention of the participants (saccades, fixations, blink frequency, pupil width, number of returns to individual areas of interest...) during the implementation of module activities. **Discussions:** It is expected that, based on the results of this research, it will be determined what affects the development of environmental competences in the field of the hydrosphere among pre-service chemistry teachers. It will also be determined where pre-service teachers direct their attention during the laboratory activity, how they process information during the laboratory activity and how learning through research affects the development of the teacher's environmental competences.

Keywords: Inquiry-based learning, pre-service teachers, education for sustainable development, environmental competencies, water pollution

7. Student Seminar (Room A)

7.4 INTRODUCTION OF HYDROSPHERE ENVIRONMENTAL PROBLEMS IN LOW SECONDARY SCHOOL CHEMISTRY LESSONS

Taja KLEMEN, Iztok DEVETAK, University of Ljubljana, Slovenia

Introduction: The hydrosphere consists of the total amount of water on our planet. Water is an essential chemical substance for the survival of all known life forms. Human's pursuit of a high standard of living has brought threats and consequences to the environment. The hydrosphere is becoming increasingly polluted with artificial pollutants from human and industrial wastes. The development of environmental awareness and scientific knowledge can help to change our relationship with nature and thus promote responsibility for conscious choices in our daily lives. This can be achieved by effectively incorporating environmental content into the educational system. Chemistry as a subject helps to develop students' critical thinking about environmental hazards and encourages them to construct their own ideas and possible solutions for a sustainable future. Previous studies conducted with low secondary school students reported a low level of knowledge about hydrosphere environmental problems and the lack of interest in addressing these types of problems. The debate on the best didactic approaches and teaching methods to improve the quality of students' knowledge and their active participation in solving environmental problems continues. For these reasons, the aim of the research was to optimize and implement an online workshop with examples of integrating hydrosphere environmental problems into chemistry classes based on the learning objectives of the chemistry curriculum. The study also aimed to evaluate the effectiveness of integrating this content by comparing differences in student achievement tests based on their level of situational and individual interest before and after the online workshop. The content of the research is consistent with the sustainable development goals (SDG) and it focuses on quality education, life bellow water and clean water and sanitation. **Methods:** The research was based on the descriptive and causal non-experimental method of empirical pedagogical research. A quantitative research approach was used for the research. The study included 145 ninth grade students from seven Slovenian low secondary schools. The first phase of the research was conducted before the students participated in the online workshop. The students solved the preliminary achievement test and the individual interest questionnaire. In the second phase, students actively participated in the online workshop. Immediately after the end of participation, they completed the achievement post-test and the situational interest questionnaire. Two weeks later, the third phase was conducted, in which the students completed the delayed achievement test. The collected data was analyzed quantitatively using the SPSS program. **Results:** The results show that students scored significantly lower on the preliminary achievement test than on the achievement post-test and the delayed achievement test. Only 42.1% of students scored more than half of all possible points on the preliminary achievement test prior to participation in the online workshop. 61.5% of the students scored more than half of all possible points on the achievement post-test after participating in the online workshop. Students' learning achievements do not differ on the post-and delayed achievement tests. Differences in scores on the preliminary achievement test, the achievement post-test and the delayed achievement test were statistically significant between students with different levels of individual and situational interest. Students with higher levels of individual interest or situational interest scored better on all achievement tests.

Keywords: Hydrosphere environmental problems, low secondary school, chemistry lessons, online workshop, interest.

7. Student Seminar (Room A)

7.5 KNOWLEDGE AND MISCONCEPTIONS ABOUT THE LITHOSPHERE AND PEDOSPHERE AMONG 9TH GRADE PRIMARY SCHOOL STUDENTS IN SLOVENIA

Luka RIBIČ, Miha SLAPNIČAR, Iztok DEVETAK, University of Ljubljana, Slovenia

Introduction: The content of environmental chemistry is part of environmental education, the effectiveness of which has not yet been investigated. The purpose of the research was to discover how well Slovenian ninth-graders know concepts related to the field of environmental chemistry, or more precisely the field of lithosphere. It was also investigated about which topics in this field the students have the most misconceptions and in which areas there is the biggest lack of knowledge. **Methods:** The sample was random as the data were collected at different primary schools in different regions. Students solved out written test of knowledge about lithosphere and pedosphere, that was made up of ten questions. Results that students achieved on knowledge test about lithosphere and pedosphere were then compared among students from different regions, among students with different final grades in the subjects of chemistry, biology and physics, and between male and female students. For the purpose of the research students filled out a questionnaire in written form, with four items to determine students' self-image in the field of knowledge of the lithosphere and pedosphere, and eleven items to determine individual interest in learning content from this area. **Results:** When analyzing the results, it was found, that the students achieved at least 50% of all possible points on the knowledge test, but the average score of the students was poor. The final grade in the 8th grade in the subjects of biology, chemistry and physics has a statistically significant effect on the students' knowledge about lithosphere and pedosphere. Students from different regions showed significant differences in knowledge about those topics. Students from Posavska region achieved more points than students from other areas, while students from Primorska region scored the least. We also checked the level of interest among students from different regions and found that students from Posavska region are most interested in learning topics about lithosphere and pedosphere. Between genders, there were no statistically significant differences in the average number of points achieved on the knowledge test about lithosphere and pedosphere. Even in individual interest, there were no significant differences between genders. Analysis showed that there are some misconceptions from this topic among Slovenian students. Most of the misconceptions were detected in tasks, that were on higher cognitive level. **Discussions:** The results of the research will help teachers in planning their lessons. Educating students in direction of sustainable development can become more effective and their knowledge more persistent.

Keywords: Environmental chemistry, lithosphere, pedosphere, misconceptions, sustainable development, SDG 4 Quality Education, SDG15 Life on Land

7. Student Seminar (Room A)

7.6 THE ATTITUDES OF ADOLESCENTS TOWARDS THE ENVIRONMENT AND THE ROLE OF OUTDOOR EDUCATION PROGRAMMES

Hana ROŽMAN, University of Ljubljana, Slovenia

Introduction: In this study, we aim to investigate adolescents' attitudes toward the environment and the importance of participation in outdoor extracurricular educational programmes in the development of their environmental attitudes. **Methods:** The main objectives are to investigate adolescents' environmental attitudes before and after participating in a one-week outdoor education programme and to collect their opinions about the personal benefits of the outdoor education programmes they attended. With the results obtained, we hope to further develop CSOD outdoor education programmes and contribute to a better understanding of the development of students' environmental attitudes. **Discussions:** Currently, the questionnaires of the students who participated in the outdoor education programmes and the transcriptions of the interviews with the teachers are being analysed. The teachers who accompanied the students in the programmes were interviewed to obtain more information about the adolescents' behaviour toward the environment, their skill development, and their social skills.
Keywords: Outdoor education, environmental attitudes, social skills

7. Student Seminar (Room A)

7.7 USING THE INATURALIST APP IN BIOLOGICAL RESEARCH AND EDUCATION

Žan RODE, University of Ljubljana, Slovenia

Introduction: iNaturalist is an application for the detection and identification of organisms as well as communication between users, aimed at both amateur and professional scientists. This master thesis should give an insight into the usefulness of the application in education and research through different methods. **Methods:** We used a few different methods in this research. Through various article search engines we searched for research papers that used the iNaturalist app in the classroom environment. The articles found were then reviewed and a cross-section of methods and results obtained by foreign researchers was created. Another method was to test the usage of the app in school. We took advantage of the school's participation in the Forgenius project, which focused on gaining insights into the diversity of European forests and their resilience to climate change – here we saw great potential for using the iNaturalist app. The app was then implemented in another elementary school, where we adapted the way of working according to feedback from teachers, students and pupils who were present during the first implementation. The third method was to review the observations recorded in Slovenia – in this way we gained insight into the groups of organisms most commonly observed by users in our country. The last, fourth method was an interview. We selected a group of users who have recorded observations of organisms of the genus Mantis in Slovenia since the application was created. We contacted these users through the iNaturalist website and invited them to participate in an interview where we obtained information about their education, hobbies, occupation, and how they record and determine data. **Results:** In total, we found 13 unique searches about the use of the iNaturalist application in education on various article search engines. We found that a common method of use was conducting BioBlitz's and using the application with students to increase knowledge of taxonomy and improve attitudes toward nature. Awareness of the importance of biodiversity was also frequently promoted. We were successful in our attempts to use the app in a school setting. The application was interesting for both students and teachers. During the activity, students acquired new knowledge about the names of plants and other organisms, and some students indicated that they would like to use the app outside of the school context. For the third objective, we collected data on species recorded in Slovenia. We found that over 60,000 observations had been recorded in Slovenia by April 2022, more than half of which were marked "research grade". We also found that the observations concerned over 5,300 species, among which plants and insects predominate. In the last objective, where we gained insight into users recording representatives of the order of praying mantis, we found that users mainly used the application as a method to store their observations and deepen their knowledge. In most cases, respondents were invited to use the app by an acquaintance, and we also found that the vast majority used biological keys and other tools to identify organisms. **Discussion:** iNaturalist is an application that is rapidly gaining traction for both professionals and laypeople. The number of research papers investigating the educational benefits of the application is increasing, although the number of articles is still too small. The authors of the articles often focus on events such as the BioBlitz, since these are already an established practice to which it is very convenient and efficient to add an ICT aspect. It might be smart to consider the usefulness of the application in the school context and advise teachers on how and where to incorporate it into their learning process. We see that the use of technology in the classroom is attractive and often used "just because it is new." Of course, teachers need to ask themselves where it makes sense and where it does not, and a set of materials will greatly help them in these decisions and planning. iNaturalist already has some materials and tips for teachers on their website, but most of them are written in English and not in Slovene. With this application we can bring a lot of good into the classroom, both in knowledge and in stimulating the emotional side of the students. The current state of biodiversity and climate change shows us how important it is that we change our behaviour, and the easiest place to start is with our children. Our research is directly related to Goal 15 of the ESD indicators, which focuses on protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainable management of forests, combating desertification, and halting and reversing land degradation and halting biodiversity loss. According to research, citizen science projects like iNaturalist help foster a positive relationship with the environment because they require learning about the species that surround us and make their users aware of the sheer amount of biodiversity around them.

Keywords: iNaturalist, Citizen Science, Smartphone

7. Student Seminar (Room A)

7.8 CHILDREN'S PERCEPTION OF INSECT FEELINGS: A SURVEY OF LOWER ELEMENTARY SCHOOL CHILDREN ENGAGED IN INSECT BREEDING

Karen ONODERA, Kyoto Koka Women's University, Japan; Hiroki FUJII, Okayama University, Japan

Introduction: In life science education for lower elementary school students, the aim is to encourage students to "think from the standpoint of animals and plants" rather than being self-centered, to make them aware of the connection between themselves and living things, and respect life. In the animal-breeding activities in life science, children focus on thinking about what the animals want, and satisfying their needs through activities such as creating appropriate places for them. This entails thinking and acting from the perspective of another entity, which is of great significance in fostering compassion, empathy, and an attitude of respect for life. Thus, as children are expected to develop their own thinking to include the feelings and perspectives of animals, this sequence of events leads to a shift from thinking centered on humans to thinking centered on life, ecosystems, and nature, leading to a view of coexistence between nature and humans. In order to be able to expand their perspective from a self-centered focus to encompass life, ecosystems, and nature, students are required to imagine the feelings of living things with an eye to their original growing environment, and to have their own thinking align with that of these creatures. In the second grade of elementary school, students engage in breeding insects (praying mantis and cricket, which are the most familiar creatures to them). **Methods:** we conducted a questionnaire survey to determine the extent to which students were able to think from the perspective of insects. The survey comprised two questions, one that asked about the feelings of the insects in the breeding case, and the other that asked about the participants' own feelings about the insects in the breeding case. **Results:** The results of the survey of 104 second-grade elementary school students could be divided into two groups. About 80% of the responses could be classified as self-centered, putting the participants' own feelings at the forefront, such as, "Insects are interesting creatures and I want to observe them more." The remaining 20%, classified as insect-centered, reflected the belief that insects should be in the natural world. **Discussions:** Based on this, it is suggested that students' feelings and thoughts about insects become more closely aligned with those of insects. Thinking from the standpoint of insects is expected to nurture children who can empathize with insects by first considering the feelings of insects in terms of their growing environment and other factors. It is important to cultivate insect-centered thinking in the early grades because it is the starting point for respecting life and thinking about coexistence with nature.

Keywords: breeding activities; ecology education; human-nature coexistence; insect-centered thinking; life science

7. Student Seminar (Room A)

7.9 TRENDS IN SCIENCE LESSON PRACTICES ON INVASIVE ALIEN SPECIES: A SYSTEMATIC LITERATURE REVIEW

Tetsuya IDA, K.F. ARDH, Okayama University, Japan

Introduction: Invasive Alien Species (IAS) are one of the main threats to biodiversity worldwide. However, there are not enough practical researches on IAS in the context of Japanese science education. This study aims to examine trends in science lesson practices on IAS outside Japan. **Methods:** We utilize PRISMA method to systematically review English literature pertaining to school science lesson practices on IAS, from the ERIC database. **Introduction:** Categorizing lesson by educational level yielded the following result elementary school (9), junior high school (9), high school (6), and university (7), and there was no significant bias (numbers represent the number of reports; in some cases, the number of reports was counted more than once because of the different grade divisions in Japan and other countries). Next, the organisms treated are terrestrial animals (8), aquatic animals (4), terrestrial plants (11), and aquatic plants (2), most of which deal with terrestrial animals and plants. Class formats are lecture (14), dialogue (13), and observation/experiment (16) (including outdoor observation (16), indoor observation (4), and experiment (1)) (some classes are counted more than once because there are practices in which lectures are followed by observations). These forms are often combined in a single class. The students are to understand the difficulty of extermination of non-native plants. **Discussion:** From the above examples, we can see that in the classes dealing with the problem of invasive alien species, not only observation and experiments are conducted, but also various efforts are made in the form of classes to develop various abilities of learners.

Keywords: Invasive Species, Science Lesson, Systematic Review

7. Student Seminar (Room A)

7.10 THE BANANA DILEMMA: UTILIZING INTERLOCKING NARRATIVES IN SCIENCE LESSON TO FOSTER FUTURE THINKING

K.F. ARDH, Hiroki FUJII, Okayama University, Japan

ESD as a pedagogical paradigm requires teachers to perform two tasks. First, select a learning theme that focuses on a particular sustainability concern (e.g. biodiversity crisis). Second, prioritize activities that can cultivate a specific competency (e.g. Future Thinking) that is required to solve the problem In this presentation, we will explore the "Interlocking Narratives" model to guide the above task. As a proof-of concept, we included "the banana dilemma" to illustrate the connection between low genetic diversity in banana crops and a variety of solutions that are related to future sustainability issues. We also included an ESD-oriented science lesson utilizing the above topic. The lesson is highly adaptable for ESD-related school subjects, especially science.
Keywords: Future Thinking, Interlocking Narrative, Genetic Diversity, SDG5, SDG12

7. Student Seminar (Room B)

7.11 INOVATIVE APPROACHES IN SEX EDUCATION AND ITS RESEARCH AND EVALUATION.

Tim PREZELJ, University of Ljubljana, Slovenia

There are many experts for sex culture mainly from the fields of sociology or psychology. But there are only few papers and research done specifically on sex education and didactics of sexuality at different stages of human development. Even though it is a very important topic that affects nearly all parts of society, there is not enough financial and political support for the development of this quite specific field of education. Its particularities originate manly from the intimacy of the topic and subsequently special techniques and methodologies in practice as well as research and evaluation must be applied.

In practise there are still many challenges we need to overcome when it comes to sex education. Firstly, the area is *highly intimate* and therefore subjected to cultural, religious, political, and ideological interests. Secondly, it is not a self-contained area. Instead, it must be *addressed continuously throughout the educational process* from different angles within all already existing standard school subjects. However, not all has to be developed from scratch. There are already many adequate pedagogic tools and practices from school subjects that have some similar foundations and goals, like arts (dance classes, visual arts etc.) and sports. Soft skills, getting to know the body, social intelligence etc. are just some of the skills that these subjects have in common with sex education. Therefore, the existing techniques and methodologies can also be used for sex education. But of course, considering the sensitivity of the topic, with some carefully applied adaptations and changes.

However, specific tools and methodologies are not a necessity just in practise but is equally important for research and evaluation processes. Considering, that unlike in most other school subjects, there is no strict right and wrong when it comes to sex culture and sex practices, regular tests of knowledge or similar instruments are not the best option. Indirect research is one possible solution for overcoming pre-indication of right and wrong sexual practices and preferences in experimental subjects. Rather than analysing answers to set research dilemmas, we can analyse the questions people are asking about sex and sexual culture.

History taught us many times that sex culture liberation, although it brings many beneficial things for society, can lead to complex problems, if lacking proper upbringing programs and strategies. In the 70s we witnessed a sexual revolution phenomenon in western culture that later led to HIV and AIDS pandemics in the 80s due to bad and not sufficiently comprehensive sex education programs. Now, after 40 years of huge investments, research, and different campaigns, our society finally managed to get AIDS under control. The signs of that are also new sex liberation movements arising in western societies. One might think we learned our lesson, but history seems to be repeating itself with new *Neisseria gonorrhea* strains, resistant to all known antibiotics. Therefore, it is about time that educational science and policy makers start to invest more resources into sex education and take it more seriously.

Keywords: Sex education, sex culture, research methodology, creativity, art based education.

7. Student Seminar (Room B)

7.12 A RESEARCH PROJECT ON THE HIDDEN CURRICULUM FROM A GENDER PERSPECTIVE -FOCUSING ON TEACHER-STUDENT INTERACTIONS BY SUBJECTS

WANG Heqiao, Okayama University, Japan

At the end of the 20th century, various legal and institutional developments were underway to achieve the creation of equal gender relationships and a gender-equal society based on the principles of human rights, respect and the diversity of human existence as a starting point. Gender equality has attracted worldwide attention as one of the goals of the SDGs. To achieve this goal, education is attracting attention not only as a legal guarantee but also as a means of raising public awareness and putting it into practice in each country. Since the 1970s, in Japan, with Women's Impact, the gender concept started to be used in the research on the sociology of education under the influence of Europe and the United States. And since the 1990s, "gender and education" research has developed around the issue of gender in school education, focusing on gender structures and relationships.

However, in Japan, there are still problems in school education, such as "fixed gender role divisions", "subtle career guidance depending on gender" and so on. Much evidence suggests that the reason for these is that there is still a hidden curriculum in schooling that conveys gender inequality messages. In the late 1970s, the study of the hidden curriculum was greatly developed by proposing the hidden curriculum as "ideological control" and "interpretive action". Influenced by the West, over the past 40 years, studies have been accumulated from the standpoint of gender studies to review the hidden curriculum as a non-neutral school culture in Japan.

Therefore, studying the hidden curriculum from a gender perspective has an important role to play in promoting gender equality in education and even the construction of a gender-equal society. According to Johnson, there are two types of hidden curriculum: explicit hidden curriculum and implicit hidden curriculum. And it is the implicit hidden curriculum that acts more unwittingly, disseminated through teacher-student interaction, student-student interaction, teachers' attitudes. This study attempts to clarify how teachers portray different gender groups across subjects by examining teacher-student interactions, and thus to explore one way in which the hidden curriculum exists in schooling.

Keywords: Hidden curriculum, Gender, teacher-student interaction

7. Student Seminar (Room B)

7.13 STUDY ON THE PROGRAM OF DEVELOPING GLOBAL LEADERSHIP: FOCUSING ON THE REFLECTION PROCESS

GAO Yu, Okayama University, Japan

This study attempts to propose organizing principles for global citizenship education programs that emphasize leadership development through the design of specific programs. Leadership in this study does not refer to a person's ability to hold a certain office or position, but rather to the ability to demonstrate strength in working with different people and producing new results. This ability is considered as one of the key qualities of global citizenship and also as one of the important elements in education for sustainable development, and a program will be developed with its principle of development as a pillar. In addition, in this study, I consider reflection to be an important part of the program. Reflection allows people to discover their previously unnoticed selves, which is essential when developing leadership. The purpose of this study is to develop and propose a global citizenship education program that reflects the above theory and is designed to be implemented at the higher education level.

I have been analyzing high school programs implemented to develop global leaders, based on the studies of Mikinari Higano, a leading researcher on leadership education. According to Higano, leadership is a quality expected of all people, not limited to those who hold a particular position or office. When such leadership is demonstrated, "everyone who participates in the program works in their respective roles, which moves others, and through the accumulation of these efforts, the group achieves some kind of goals as a result. Local boards of education are promoting programs aimed at developing global leaders, and universities and other higher education institutions are also implementing global leader development programs. The expectation of global leaders is to "influence individuals, groups, and organizations with cultural, political, and institutional backgrounds that differ from those of the leader ". In the educational program to be developed by this study, I would like to propose an educational principle that emphasizes reflection, as stated in the subtitle, and that differs from the programs already in place in the various venues mentioned above. In addition, this study will also examine the role and significance of reflection in the program. Reflection has been shown to be effective in leadership development programs in Huber (2002), Roberts (2008), and James & Jayne (2020), and it has been demonstrated that appropriate reflection enhances educational effectiveness.

In this study, by using Asia and Europe as the field, I would like to propose the principles of organization of a global leadership program that effectively incorporates reflection and present a concrete plan for the program.

Keywords: Leadership, Reflection, Global Citizenship Education

7. Student Seminar (Room B)

7.14 IDENTIFYING THE SKILLS AND FUNCTIONING OF UNIVERSITY STUDENTS WITH DYSLEXIA IN SLOVENIA

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Specific learning difficulties, including dyslexia, are lifelong difficulties, but the specific needs associated with them may be different at different stages of life. Thus, dyslexia is also present in university students, but the problems themselves, the specific needs associated with the problems, and the optimal strategies for the individual may differ from those in childhood and/or adolescence. Identifying dyslexia in university students and identifying the skills and functioning of university students with dyslexia is particularly challenging because of the ways of compensating that individuals have developed over the years. At the same time, such identification provides the basis for quality support and possible adjustments within higher education that are reasonable and relevant to individual circumstances. This area is still very under-researched in Slovenia. Since dyslexia is characterised by difficulties that are largely related to the structure and characteristics of the language, the methods of identification and the results from other language environments cannot be fully and confidently transferred to the Slovenian context.

The doctoral research aims to identify the skills and functioning of university students with and without dyslexia, focusing on the areas of cognitive and reading skills, and executive functioning. A quasi-experimental and correlational approach combined with qualitative research is used. The instruments and data collection procedures are currently being pilot tested. The results will help to advise and provide effective, and quality support for university students with dyslexia.

In the context of the Sustainable Development Goals Indicators, the objectives of the doctoral research are directly related to the indicator "quality education" (4), which refers to ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. With appropriate and quality support, we can ensure that the dropout rate for dyslexic university students decreases and that an environment is created in which university students with dyslexia can reach their potential. The issue is also indirectly linked to several other indicators in the Sustainable Development Goals Indicators, including the indicators "reduced inequalities" (10) and "decent work and economic growth (8).

Keywords: Dyslexia, Functioning, Skills, University students

7. Student Seminar (Room B)

7.15 PREJUDICE FROM CULTURAL DIFFERENCES: A CROSS-CULTURAL EDUCATION DEVELOPMENT COURSE

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This research aims to address the problems caused by cross-cultural misunderstandings, based on the psychological theory of course development to eliminate preconceptions and prejudices. The contact hypothesis theory suggests that prejudice and conflict between groups can be reduced when the members of the groups interact with each other. The theoretical basis of the course development is the Longitudinal Contact Model proposed by psychologist T.F. Pettigrew based on the contact hypothesis. When people encounter people from different cultural backgrounds, they sometimes categorize others into different groups based on preconceptions and biases. This research deals with discrimination caused by categorizing the other person as a different group from oneself. The subjects of the course were Japanese university students and international students. During the exchange, Japanese university students and international students exchanged ideas about garbage bins and garbage disposal to make students think about cultures and customs that are different from their own, and rethought what they take for granted, and eliminated the discrimination they unconsciously engage in. Before COVID-19, when tourist areas were filled with international travelers, the Japanese media often reported on the bad behavior of international travelers However, litter is still to be a problem even though the number of international travelers has decreased significantly after COVID-19. Such news made some people think that "international travelers = no manners", thus creating prejudice against foreign tourists. In addition, there is a need to go beyond the superficial phenomenon of littering to explore the misunderstandings caused by cultural differences. Therefore, in the course developed, Japanese university students and international students were divided into groups to discuss how to solve this problem. Rethink their previous perceptions and look at other cultures anew. And discuss the one-sided media coverage of littering by international travelers. Finally, the change in students' attitudes was evaluated based on the pre-and post- comment sheet.

Keywords: Course Development, Prejudice, Longitudinal Contact Model

7. Student Seminar (Room B)

7.16 JAPANESE LANGUAGE EDUCATION FOR FOREIGN TECHNICAL INTERNS- FOCUSING ON CITIZENSHIP AND CAREER DEVELOPMENT-

Hoang Ngoc BICH TRAN, Okayama University, Japan

Introduction: This paper attempts to construct a theoretical framework and make concrete proposals regarding the principles and methods of Japanese language education in local communities for the development of citizens. In doing so, we will focus particularly on Japanese-language education for foreign technical intern trainees, focusing on the career development of technical intern trainees and how Japanese-language education can be useful in this regard, which will be discussed theoretically through analysis of previous studies. One of the problems faced by foreign technical intern trainees is that they are not sufficiently guaranteed learning that will lead to their career development due to the lack of built-in content to nurture citizens who will participate in the local community. **Methods:** This paper analyzes previous studies that have examined the relationship between citizenship education and Japanese language education, and examines theoretically what role Japanese language education can play in helping foreign technical intern trainees pursue their individual lifestyles in Japanese society. The following suggestions were obtained regarding the ideal form of Japanese language education that is meaningful to technical intern trainees. (1) It is necessary to create a place for learning that builds not only a connection with the local community but also an equal relationship with local Japanese people. One of the ways to achieve this is in the form of Japanese language education coordinators supporting learning together with Japanese language learning supporters. (2) The content of learning should promote not only mutual understanding but also value formation through dialogue with people who have different values. **Results and Discussions:** The principles and methods of Japanese language education will be presented as a concrete example of Share&chill's approach. It is important for technical intern trainees, as members of society, to be on an equal standing with Japanese people and have opportunities to participate in discussions to create a livable society together with Japanese citizens who have different values. Share&chill's approach is to create such opportunities on a regular basis, thereby improving their Japanese communication skills and their ability to communicate with people who have different values. The Share&chill program is not only about mutual understanding of values and culture, but also about voluntary participation as a member of society. Although local Japanese language classes like Share&chill are necessary for technical intern trainees in the future, there are limits to what local organizations alone can do to provide support to technical intern trainees, and there are many things that cannot be pinned down. Therefore, it is necessary to widely raise awareness of the initiatives and involve various stakeholders in their implementation. In addition, it is a challenge for the future to further enhance support for education for technical intern trainees by strengthening the system of cooperation between the local community, government, and companies as part of the effort.

Keywords: Japanese language education, Citizenship education, Foreign technical interns, Career development, Local community

7. Student Seminar (Room B)

7.17 PRACTICAL STUDY ON CREATING A PLACE TO CONNECT CHILDREN WITH FOREIGN ROOTS AND REGIONAL SOCIETY IN JAPAN: ATTEMPTS TOWARD A MULTICULTURAL COEXISTENCE EDUCATION IN OKAYAMA URBAN COMMUNITY

XIE Xinyi, Okayama University, Japan

In this research, I focus on the support for the children with foreign roots in the contemporary Japanese regional society and the activity attempts toward a Multicultural Coexistence Education. This is an attempt at community educational activities for children with foreign roots in Okayama. In this research, I would like to clarify the characteristics and issues of efforts aimed at multicultural coexistence through my practice of local educational activities for children with foreign roots in Okayama City. It is a reality that the number of children with foreign roots in Japan is steadily increasing as the global society advances. Although there is educational support for students with foreign roots in school education, it is difficult to provide educational support that meets the needs of each student with foreign roots due to the limited resources within the school and the busyness of teachers. if the situation of inadequate educational support in schools continues, the educational gap between children from foreign or multicultural societies in Japan lacks educational support for children with roots in foreign countries and Japanese students will widen due to the difference in language ability. In addition to not being able to guarantee academic ability due to differences in language ability, it can be said that children with roots in foreign countries are not familiar with the school and the local community. Each local government must have the viewpoint to promote measures for the acceptance and coexistence of foreign children at schools, which play a central role in the region. Children with foreign roots, rather show the characteristics of community education and link diverse resources. On the other hand, it is a way of providing educational support that “leaves no one behind”, and it is important for students with roots in foreign countries to experience multicultural activities with local community residents, Japanese students, or foreign exchange students. By experiencing multicultural exchange activities of different age groups, while keeping in mind the concept of “multicultural coexistence”, not only students with foreign roots but also local Japanese residents, I think this is a place that is necessary to reconstruct a multicultural coexistence community for both Japanese and foreign children. From the standpoint of a minority of foreigners in Japanese society, different from the viewpoint of the majority of Japanese people, I will provide a concrete presentation on the practice of urban community education for children with foreign roots in Okayama and will Conceive the further research methods.

Keywords: Students with foreign roots in Japan, Multicultural coexistence education, Regional education.

7. Student Seminar (Room B)

7.18 DEVELOPMENT OF CITIZENSHIP EDUCATION PROGRAMS TO FOSTER ACTIVE CITIZENS -BASED ON COLLABORATION WITH THE LOCAL COMMUNITY

Nagisa YAMADA, Okayama University, Japan

The purpose of this research is to develop a citizenship education program in cooperation with the local community in order to foster active citizens. An active citizen is a person who can coordinate opinions among people with different ideas, determine what is desirable for society as a whole from a broad perspective through a holistic exchange of ideas, and demonstrate this through their attitudes and actions.

In recent years, a variety of educational activities utilizing local educational resources have been conducted in Japanese educational settings. This is thought to be related to Article 13 of the Fundamental Law of Education, revised in 2006, which stipulates "mutual cooperation and collaboration among schools, families, and local residents. In addition, the Courses of Study also include "curricula which open to society," and the creation of schools that utilize local resources has become an important part of the curriculum. In Japan, the voting age was lowered from 20 to 18 in 2015. Since then, content related to political participation and the electoral system has become more important than before, especially in upper secondary schools.

In addition, because classes are required to be based on specialized content, local election commissions and non-profit organizations have begun to participate in classes as outside personnel. However, there are many problems with these classes. One reason is that the classes are entirely entrusted to outside personnel. Such classes often have general content, such as lectures on the electoral system or mock voting. In addition, because there is little teacher intervention, many of them are not in line with the actual situation of the children or cannot be positioned in the curriculum. Based on an awareness of these issues, this study clarified the significance and challenges of utilizing outside personnel at school sites and examined the need to develop programs to resolve the above issues.

Keywords: Citizenship Education, Community, School Education

7. Student Seminar (Room B)

7.19 Home Economics Literacy of Slovenian Primary School Children

Martina ERJAVŠEK, University of Ljubljana, Slovenia

Introduction: In society, many problems are discernible in different areas covered by the multidisciplinary concept of the discipline of home economics, which are interlinked and not homogeneous. With its multidisciplinary approach, the field of home economics education integrates knowledge from different disciplines and has an important role in addressing the problems of a changing society, which also reflect at the level of the family and the individual. The primary education process must ensure that pupils acquire the appropriate knowledge and skills needed to develop home economics (HE) literacy. Only individual literate in home economics can improve the quality of their own lives by applying and transferring knowledge and skills to concrete everyday life situations, which in turn contributes to a better quality of life for the family and society. To achieve this, quality home economics education is needed, with objectives and curriculum content that reflect current social needs, considering the basic orientations and a common philosophy of the HE disciplines. In the following, the research of the doctoral dissertation will be presented. The aim of the first part of the research was to define the content areas of home economics education on the basis of a content analysis of the curricula of the home economics subject or a comparable subject for primary education abroad and in Slovenia. **Methods:** The analysis included 17 curricula for the home economics subject and two other documents dealing with home economics education. The second part of the study sought to determine the views of teachers, pupils and parents on the importance and usefulness of home economics education and literacy. A Delphi methodological approach was used. The first round of the Delphi study involved 30 teachers, 34 9th grade pupils and 34 parents of 9th grade pupils. The second round of the Delphi study involved 16 teachers, 33 9th grade pupils and 29 parents of 9th grade pupils. In the third part of the study, HE literacy standards were developed based on the findings of the first and second parts of the study; they were used to design the HE literacy knowledge test. The content areas of the HE literacy were identified with their associated content. The aspects of HE that are included in all four content areas of the HE has also been defined. In the fourth part of the study, the level of HE literacy knowledge acquired and the pupils' HE literacy behaviour were tested by means of a knowledge test at the end of the 6th and 9th grades. 652 pupils in the 6th and 9th grades were included. Their parents' attitudes towards HE literacy and the frequency of their support for their child to get involved in tasks belonging to different home economics areas in their home environment were also investigated. 652 parents of pupils who participated in the HE literacy study were included. **Results:** The results of the first part of the research (content analysis of the curricula of the home economics) will be presented below. The first part analyses the curricula of the subject of home economics abroad and in Slovenia. It was found that Slovenia has a more diverse range of subjects, when compared to the other countries analysed. The Slovenian curriculum includes content relating to finance, textiles, nutrition, home and family, environment, consumption, health and healthy lifestyles, and social skills. **Discussions:** Despite the diversity of content, content deficit was perceived in some of the home economics areas. These are the areas of health and well-being, nutrition, textiles, environment and home, which need to be supplemented with the identified missing content. A difference between countries in the age range of pupils receiving HE education was perceived. Slovenia is the only one of the 14 countries that teaches the HE subjects solely in 5th and 6th grades, when pupils are aged between 10 and 12 years. All the other countries provide home economics education before and/or after this age – until the end of primary education. The content of the research can be linked to various goals of sustainable development, such as: good health and well-being, quality education, gender equality, reduce inequalities, responsible consumption and production.

Keywords: Home economics education, home economics literacy, primary school pupils

7. Student Seminar

7.20 VERIFICATION OF INNOVATIVE TEACHING MATERIAL FOR CONSUMER EDUCATION IN ELEMENTARY SCHOOL IN HOME ECONOMICS

Barbara Zaman, University of Ljubljana, Slovenia

In the past decade, it has been observed in the global economic market that the rapid change of fashion, modern technology and the development of innovative products are affecting people's pollution and shopping habits. In an effort to educate individuals to become sustainable consumers of the future, it is necessary to include consumer education in schools. With a sufficient level of knowledge, awareness, and guidance of individuals towards critical consumerism, we can improve the consequences of environmental and economic problems and encourage society towards sustainability and green consumerism. Since education is a complex process that not only acquires knowledge but also develops practical skills, it is necessary to start consumer education in early childhood. Research shows that young consumers are sensitive to the issue of environmental protection and can therefore significantly influence consumption in the family and the development of a sustainable society. In Slovenia, students are exposed to consumer education as early as elementary school in home economics, where they gain knowledge and skills in economics, textiles, the environment, and nutrition. Part of this content is meaningfully linked to consumer education and literacy. My dissertation research is still in its early stages. The main goal of the dissertation is to investigate how much knowledge and what attitudes elementary school students have about consumption in general and using the example of the process of buying and consuming textile products. The fact is that textile waste is one of the most polluting wastes today. In addition, the aim is to create simple and accessible learning materials that guide students towards sustainable consumption of textile products and remind them of the environmental, social and economic consequences of wrong choices. The goal is also to create guidelines for teaching selected content in home economics based on the research data obtained and a review of domestic and international literature.

Keywords: Consumer education, sustainable consumption, consumer awareness