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(Tables, figures, pictures, and reference list should NOT be included.)

Presentation Title: ‘Revisiting the Okayama Model of Education for Sustainable Development by Using the Quintuple Helix Model of Analysis’
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Abstract:
<p>The Japanese education for sustainable development, ESD movement has sought to collectively challenge conventional education in the context of education for sustainability. As a community-based activity led by citizens, the Okayama ESD project grows up to 260 establishments of community learning centers, CLCs or kominkans in implementing ESD in Okayama prefecture. The CLCs works closely with the school district and become the ESD hub for the school and some of kominkan become sources for the online lifelong learning center. In Okayama City, it is reported that more than ten percent of the population is involved in activities for making sustainable livelihood; where about 30,000 people are engaged in the sector of environmental protection, about 34,000 in the sector of promotion of gender equality, and about 7000 in the health promotion sector and many more. Concerning global environmental challenges, there are six thematic issues highlighted in the Okayama Commitments, namely: environmental conservation, disaster risk reduction (DRR), income generation, entrepreneurship, community development, cultural diversity and dialogue, intergenerational exchange, literacy, and empowerment.</p> <p>In April 2005, there was an agreement among experts and leaders, including researchers of universities in Okayama City to work together for the creation of a local base for the promotion of ESD. The Okayama ESD project governs by the Regional Centre of Expertise (RCE) Okayama and the Okayama Municipal Government. Further, the Okayama ESD Promotion Commission was established with the aim “to create a community where people learn, think and act together towards realizing a sustainable society” (Okayama ESD Promotion Commission 2014). The aim reflects the five elements of reorienting education for sustainability: knowledge, skills, perspectives, values, and issues. The Okayama Declaration on RCEs and ESD Beyond 2014, stated that RCEs are designed to achieve “systemic transformation by contributing to the realization of socially inclusive and equitable economies within the renewable capacity of the earth and planetary systems”. In 2016, the Okayama ESD Project received the UNESCO-Japan Prize on ESD and as a world leader in promoting ESD, it’s called the Okayama Model of ESD (ESD Success Story 2017). All of these interactions reflect the frontier of converging knowledge systems, network and sector of innovation driven by complex, non-linear and dynamic processes of knowledge creation, diffusion and use of the Okayama community.</p> <p>This active participation of citizens and multi-stakeholder involvement in Okayama prefecture inspire re-conceptualize, the ways, and means that knowledge production, utilization, and renewal take place in the context of the knowledge economy and society (gloCal knowledge economy and society). In the context of knowledge production and innovation, the Okayama model of ESD may challenges the conventional method of education system as a sole knowledge provider or mode 1 knowledge production (traditional research by universities) (Godin &amp; Gingras, 2000) and also mode 2 knowledge production (knowledge that is generated when mode 1 knowledge is applied and put into practice) (Gibbons et al., 1994; Nowotny, Scott, &amp; Gibbons, 2003). In another way, the Okayama ESD project reflects mode 3 of the knowledge production system (Carayannis &amp; Campbell 2009) which lead by kominkans or community ESD as a democratization of knowledge related to a sustainable livelihood in the structured five knowledge sub-system. The five sub-systems interact in the Quintuple Helix model are i. the educational system, which generates and disseminates new knowledge; ii. the economic system, which controls, possesses and generates economic capital; iii. the political system, which has political and legal capital (e.g., laws, clearances, policy, public goods); iv. civil society, which has the social capital, and is characterized by traditions, values, and behavioral patterns; and v. the natural environment, which has natural capital (e.g., natural resources, climate, air quality, geological stability) (Carayannis, Barth, &amp; Campbell, 2012).</p>



Several kominkan case study reflects the knowledge co-creation and dynamic interactions among sub-system. For example, the case study of Seno Kominkan in raising a community of Seno and Mishima districts as a new residential area was performed by sharing with them their local history, 'water wells map'. The initiative by local residents explores historically the important water sources, how local people in the past took good care of water throughout their lives, thus deepening their knowledge of local resources. The case study of Saidaiji Kominkan operates by providing the volunteer training course 'Udon School' to help residents make friends and find motivation in life after retirement. Participants focus on learning how to make Udon noodles and soup and open 'Udon Café' in a popular shopping area which slowly going out of business. Further, the initiative re-develop community businesses, which will lead to the revitalization of the local community. This an example of input from cultural-based knowledge creation that brings into the economic system by creating new jobs and growth by reviving the local food culture 'Udon'. The quintuple helix analysis will identify the input, output, knowledge creation and innovation for each sub-system. In the end, the new model of Okayama Quintuple Helix analysis will provide various types of knowledge for a selected case study at local kominkans, Okayama prefecture.

By using the quintuple helix analysis, gaps in implementing knowledge-based society will identify for further improvement of the Okayama Model of ESD. The Okayama Quintuple Helix Model of ESD is a platform for the manifestation of inter- and transdisciplinary approaches of co-creation, co-evolution, and co-implementation of knowledge for sustainability-driven by various actors. It will enhance other actor's performance as a knowledge producer as well as knowledge users towards the democratization of knowledge which crucial in the eco-societal-transition of the society. Hence, revisit the Okayama Model of ESD by using the Quintuple Helix model to help in strengthening the existing model in the context of knowledge-based society for further eco-innovation and eco-entrepreneurship of inter- and transdisciplinary platform. It may give a different insight into ESD especially in reorientation education for sustainability in more structure manner.