

USING A SYSTEMS-BASED EVOLUTIONARY LEARNING LABORATORY TO ADDRESS THE “NEET - NOT IN EMPLOYMENT, EDUCATION, OR TRAINING” ISSUE IN JAPAN

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ABSTRACT

The purpose of social design is to create a feasible solution in order to solve a particular problem. For some time, social designs have been made by social entrepreneurs using unauthorized methodologies formed through lessons from their own activities and experiences. They regard these methodologies as practical, but they are often difficult to design, especially in complex social systems where multiple stakeholders are involved. Participatory systems analysis (PSA) is another valuable methodology in social design, as it provides various stakeholders with the opportunity to share their mental models with each other, to recognize and understand issues, and to identify potential barriers and drivers towards creating solutions. This method is effective in developing a consensus for finding the best solutions.

The purpose of this study was to create a model to design consensual solutions for an important social issue in Japan involving the high number of NEETS, a term referring to people who are “Not in Employment, Education, or Training.” The mental models of various stakeholders were integrated into a systems structure or causal loop model to develop an understanding of the interrelationships and patterns among the components of the model. The model was used to identify the main leverage points and systemic interventions that could help in solving the NEET problem. Bayesian Belief Network (BBN) modeling was then used for each of the identified leverage points to design an integrated systemic management and operational plan for addressing the NEET issue, which has not yet been successfully addressed in Japan. The systems models (CLM and BBN) were embedded in the Evolutionary Learning Laboratory to create a cyclical social design through which the solutions can be implemented.

Keywords: social design; systems thinking; policy making; management; complexity; Not in Employment, Education, or Training (NEET); complex issues

INTRODUCTION

The objective of social design is to create solutions that can be implemented continuously in resolving social issues. The traditional methodologies of social design are broadly classified into two. In the first approach, social entrepreneurs, having a higher consciousness in social issues, intuitively create social designs. They use their own methodologies, which arise from their own activities and experiences. This approach is highly feasible at the implementation phase because social entrepreneurs are exclusively engaged in realizing their social designs and because those who are directly affected by their activities contribute to achieving sustainable development and solving social issues. The other approach is participatory systems analysis (PSA) in which stakeholders directly participate in social design using a systems thinking approach. In this methodology, the stakeholders systematically study an issue in order to understand it and analyze

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the solution using systems thinking. The solution, therefore, arises from the consensus of the participants. Each of these approaches, however, has its own limitations. In the first approach, it is frequently difficult to achieve sustainable solutions in cases of complex social systems with multiple stakeholders. The reason is that the stakeholders, having diversified backgrounds, cannot enter into the social design process. In the second approach, the stakeholder group leans on a leader who can initiate the implementation of the consensual social design. Thus, it becomes necessary to increase the feasibility of implementation. Both abilities—that is, to lead effective social design and to implement it—are required for social design. Therefore, the purpose of this study is to provide a model that includes both propulsive and consensual solutions for social issues by combining the advantages of social entrepreneur methodology and PSA methodology. In our proposed model, social entrepreneur members become the “agents” of stakeholders through learning and reflecting on the stakeholders’ mental models, and use the systems thinking approach to social design.

METHODOLOGY

The type of complex social issues in which multiple stakeholders become deeply involved is difficult to resolve. The reason is that each stakeholder has an individual mental model based on his or her own life, and the system consists of a complex cause-and-effect sequence of elements. Recent studies have indicated that the systems thinking approach is effective in resolving such complex issues (Bosch et al., 2007; Cabrera et al., 2008), and a systematic understanding of stakeholders’ mental models is emphasized in these studies. The mental model is represented as an iceberg model, which has multiple layers beneath the surface (Figure 1). As a methodology, the Evolutionary Learning Laboratory (ELLab) has been studied for a systematic consideration of problems in the social system and for systematically analyzing the solution design (Bosch et al., 2007; Cabrera et al., 2008). This methodology, the social design process, is considered as a learning cycle, and engaged stakeholders keep learning as they implement the cycle. ELLab has seven learning steps: identify issues, build capacity, develop or refine a system map/model, identify leverage points or implement systemic intervention, design solutions or develop action plans, implement, and reflect. The ELLab has provided evidence of effectiveness in its applications to various contexts of social design, such as energy, environment, education, and business (Bosch et al., 2007; Nguyen et al., 2009, 2011, 2012).

In this study, in order to solve a complex social issue, a new model is proposed and discussed, which applies ELLab as the methodology and expands on the original concept in terms of participants. All stakeholders are directly involved with identifying issues, analyzing solutions, and implementing the social design in ELLab. The social entrepreneur team, however, performs a key administrative role in the learning cycle. Therefore, this model consists of two learning steps. In the first step, social entrepreneurs become the agents of stakeholders by learning about and absorbing stakeholders’ mental models. In the second step, the social entrepreneurs, as agents of the stakeholders, design solutions using the ELLab methodology. In this study, the first learning step is called an “external learning cycle” because the entrepreneurs learn from their interaction with stakeholders. The second step is called an “internal learning cycle” because the entrepreneurs themselves continue to learn using ELLab’s seven processes, as mentioned previously. Figure 2 demonstrates the extended ELLab methodology, wherein the internal cycle represents the internal learning cycle that uses ELLab, and the gray arrow shows external learning, which consists of the interaction between social entrepreneurs and stakeholders.

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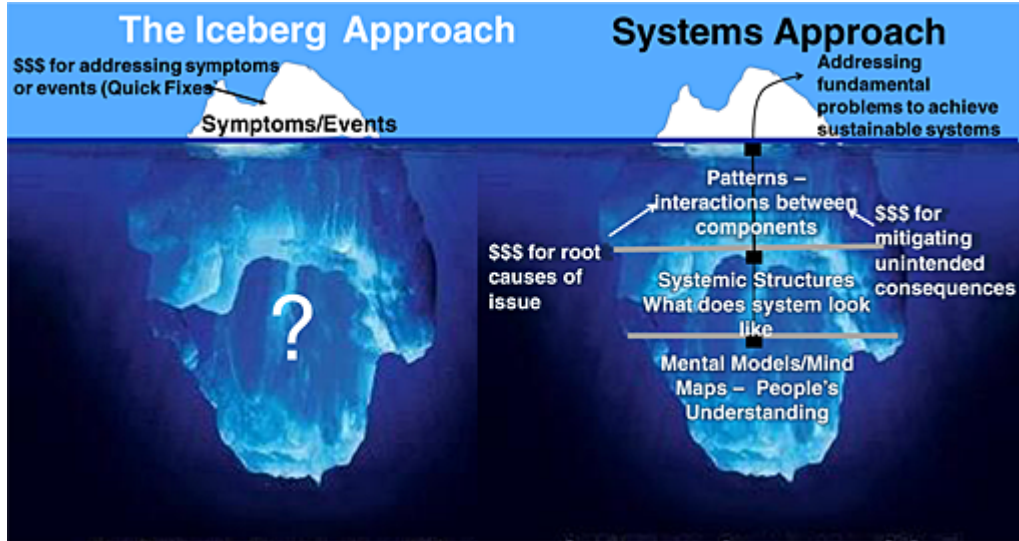


Figure 1. Iceberg model (Bosch et al., 2013)

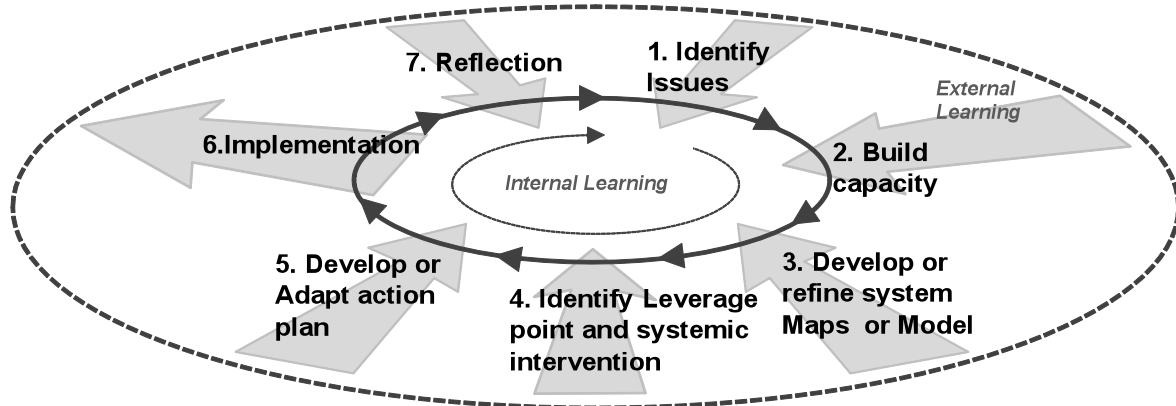


Figure 2. Extended Evolutionary Learning Laboratory for managing complex issues

Each of the ELLab's processes is explained below in relation to the study proposed in the current paper.

Identify Issues

At the problem definition step, social entrepreneurs, who will become the agents of the stakeholders, learn qualitative and quantitative information, and absorb the stakeholders' mental models.

Build Capacity

The social entrepreneurs as agents of the stakeholders are educated about the systems thinking approach and ELLab methodology so that they can heighten their thinking skills.

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Develop or Refine System Map/Model

In this step, the elements obtained in the “identifying issues” step are developed as a system model. The causal loop diagram (CLD) is applied for purposes of visualizing and discussing the problem with members. A certain issue is chosen as the theme of the CLD in order to express the interrelated variables of the complex system by using the elements, the arrow, and its direction to express the relation. The CLD provides analysts with an overhead view of the system and of the feedback loop for intelligent engagement with the issue.

Identify Leverage Point and/or Systemic Intervention

At this step, leverage points in the CLD are analyzed among the elements of the feedback loop in CLD. A leverage point is an element that has a strong impact on the relations and that is located on a deep psychological level within the stakeholders.

Develop Action Plan

After determining the leverage point(s), solutions to the social issues are considered. The selection method itself can conduce the consented solution systematically and quantitatively. Thus, the Bayesian Belief Network (BBN) is applied, a probabilistic model that can be used for prediction of phenomena that include uncertainty or reasonable decision making. In the BBN, each element is expressed as a probability function of the lower elements, and the simulation based on the hierarchic structure analyzes the most effective element for the objective factor.

Implementation and Reflection

These steps cannot be carried out here because the objective of this research is to propose a new model that combines propulsive and consensual solutions for a social issue.

Case study: The NEET issue in Japan

The case study chosen for this research in order to validate the extended ELLab methodology involves the problem of young people’s employment in Japan. This issue is referred to as NEET, which is an abbreviation for “not in education, employment, or training.” The abbreviation came into use in the United Kingdom and has now spread to many other countries. In Japan, the Health, Labour and Welfare Ministry defines as NEETS those youths between 15 and 34 years of age who are not currently in education, employment, or training. The number of NEETs in Japan has risen to 0.6 million, with 90 thousand people in the 15–19-year-old range, 150 thousand people in the 20–24 bracket, and 180 thousand in both the 25–29 and 30–34 ranges. It is clear that the increasing number of unemployed youth is having a great influence on the Japanese economy; thus, the NEET issue is the one of the most pressing problems in Japan. Different types of stakeholders are involved: the unemployed youth, their families, education agencies, job assistance centers, companies, and the government. Because this is one of the most complicated problems in Japan, it requires application of the systems thinking approach for finding a solution.

In Japan, the government has implemented some countermeasures in addressing this issue. The Ministries of Education, Culture, Sports, Science and Technology; Health, Labour and Welfare; and Economy, Trade and Industry have coordinated political measures for encouraging career education, developing occupational skills, and providing job assistance. First, as the beginning of career education, they try to help young people understand the meaning of work and attempt to

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motivate junior and high school students. The Health, Labour and Welfare Ministry has cultivated human resources to implement career education for junior and high school students; in addition, the Ministry of Economy, Trade, and Industry has arranged for career education with local companies for university students. Next, as support for job skills development, the Health, Labour and Welfare Ministry provides public vocational training by combining hands-on experience in companies with classroom lectures for youths who do not have enough experience to be hired in a company. Finally, the Health, Labour, and Welfare Ministry has initiated a job assistance service known as “Hello Work”; and the Ministry of Economy has offered the “Job Café,” a one-stop service center and job assistance service for unemployed youths, formed in cooperation with the local government, industry, and schools. As shown above, the related ministries are cooperating with each other to motivate the youth to work because motivated youths can become independent, and as a result, their unemployment rate will fall. In sum, because the Japanese policy for these issues is based on changing the NEETs’ ways of thinking, most countermeasures proceed from a job assistance perspective. As a result, the policy tends to be one way—with benefits going from the government to the NEETs. According to Figure 3, the number of NEETs in each age segment has not changed substantially for the past 10 years. This means there is still room for improvement of policies that concern NEET issues.

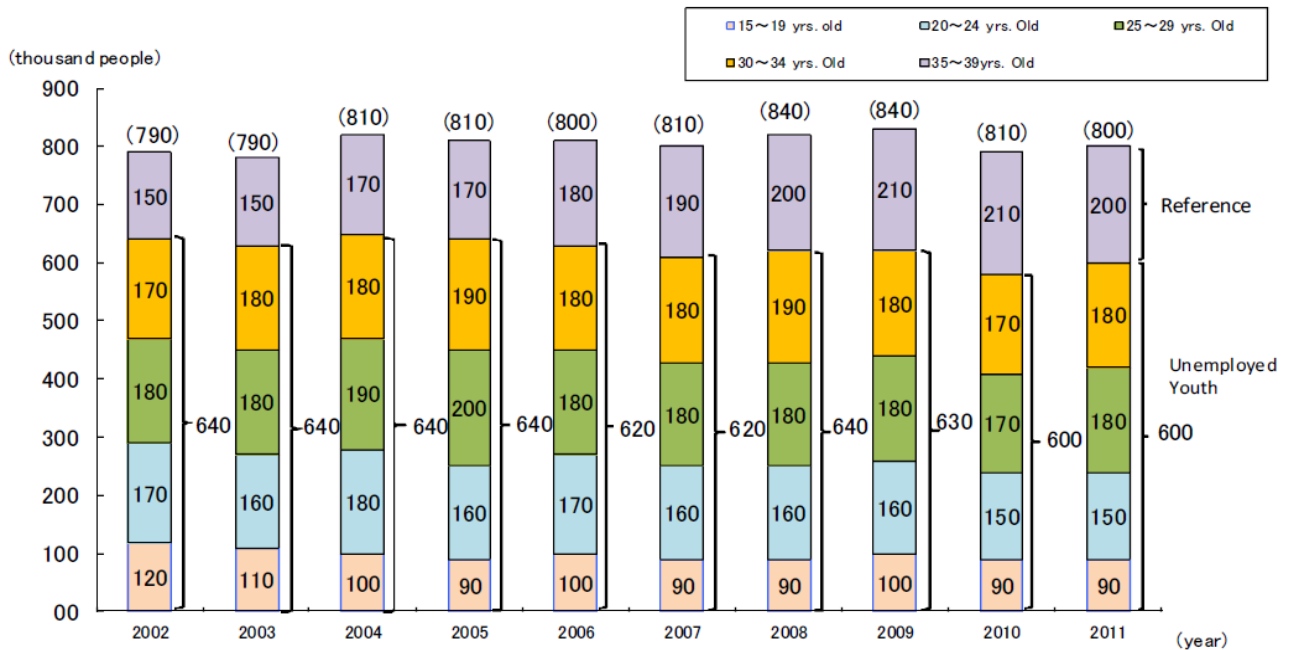


Figure 3. Changes in the number of unemployed youth

*Owing to the impact of the Great East Japan Earthquake, the results for 2011 exclude the Iwate, Miyagi, and Fukushima prefectures.

RESULTS AND DISCUSSION

The social entrepreneurs worked in a team of six people, consisting of graduate students and working people in their twenties and thirties, to construct a social design for addressing the NEET issue in Japan using the extended ELLab models. The results and discussion for each step are shown below.

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Identify Issues

At this stage, the social entrepreneur members analyzed elements that involve the NEETs' circumstances by way of a literature search as part of their external learning. The main documents researched were a white paper on children and young people, written in 2012, and the results of a questionnaire investigation on 5,000 NEETs conducted by the Health, Labour and Welfare Ministry. Interviews and observations were also conducted with the following groups.

- Observation and an interview with staff at Hello Work, the public employment security office in Iidabashi, Tokyo
- Interviews with 10 NEETs and staff, and video observation at the Columbus Academy of the K2 International Group
- Observation of three former NEETs now working at Ponyo-Ponyo schoolchild club of the K2 International Group
- Observation of about 15 former NEETs at Fellop, a facility for supporting continued employment
- Interview with a political agent working on NEETs issues

Through the above-mentioned methods of external learning, such as surveys, observation, and interviews, the members learned and absorbed the mental models of stakeholders. With this external learning step, the social entrepreneurs became the agents of stakeholders involved in the social issue. Based on the qualitative and quantitative information obtained from stakeholders, the social entrepreneur members brainstormed as a part of their internal learning and discerned the elements in addition to making groups using an affinity diagram. Figure 4 shows the results of the brainstorming.

Figure 4. Results of brainstorming on the stakeholders' mental model

Build Capacity

All members were educated in a two-month systems thinking and design thinking lecture in a design project conducted at Keio University in Japan. They had also participated in a week-long thinking system and ELLab program course conducted by two of the co-authors, Ockie J. H. Bosch and Nam C. Nguyen, in Systems Design and Complexity Management (SDCM) at the University of Adelaide. At each step, the members carried out the internal learning using the ELLab methodology obtained from their external learning.

Develop or Refine System Map/Model

The social system surrounding the NEET issues in Japan was analyzed using CLD, which

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expressed the cause and effect relationship of the elements. The CLD analysis was conducted through use of the elements in the Identify Issues step, and a question was formulated: “Why does the number of NEET youths increase?” The result is shown in Figure 5.

The results clarified that seven causal loops affect the number of NEETs: the economy loop, family loop, friends loop, social loop, self-confidence loop, self-image loop, and job-training loop. These loops consist of six positive feedback loops (R in Figure 5) and one negative feedback loop (B in Figure 5). First, the six reinforcing loops are examined. In terms of the economy loop, the economic conditions affect the number of employees in various companies. As a result, the number of NEETs changes, which in turn further affects the economic condition. As for the family loop, the economic condition affects the family income, which is the basic unit of society. As a result, communication among family members decreases, and people have to work at other places to maintain their income. Thus, motivation for taking part in society decreases, and sociability is lost because of the loss of family support. As a result, the economic condition changes. In Japan, the ratio of the nuclear family (one married couple with an unmarried child) has increased as another social phenomenon. It has been shown that loss of friendly consultants outside the immediate family has a bad effect on the children. With regard to the friends loop, communication with friends increases a person’s communication skills. As a result, sociability levels change because of increased communication. In terms of the social loop, NEETs themselves realize that they are alienated from society because their state is not in accord with the public mind—that is, the way people think. This condition affects NEETs’ mental state, making it difficult for them to take part in social activities. Concerning the self-image loop, unemployment adversely affects the self-image of the unemployed, and their motivation decreases. In this way, also, the number of NEETs increases. The job training loop affects the number of unemployed as well as the self-image loop. The skills of the unemployed improve through implementation of job training. Then, using these skills, NEETs can obtain self-confidence and improve their sociability, consequently finding themselves able to get jobs. This loop is the only balancing one (negative feedback) in the CLD. In addition, both the last loop of job training and self-image loop indicate that support from the public causes both good and bad cycles.

From the results shown above, the factors that make people into NEETs are influenced by many positive feedback loops rising from both internal and external elements. Once a positive loop begins, the phenomenon continues to expand or shrink. On the contrary, if the key element is found for the positive loops, the phenomenon can be settled.

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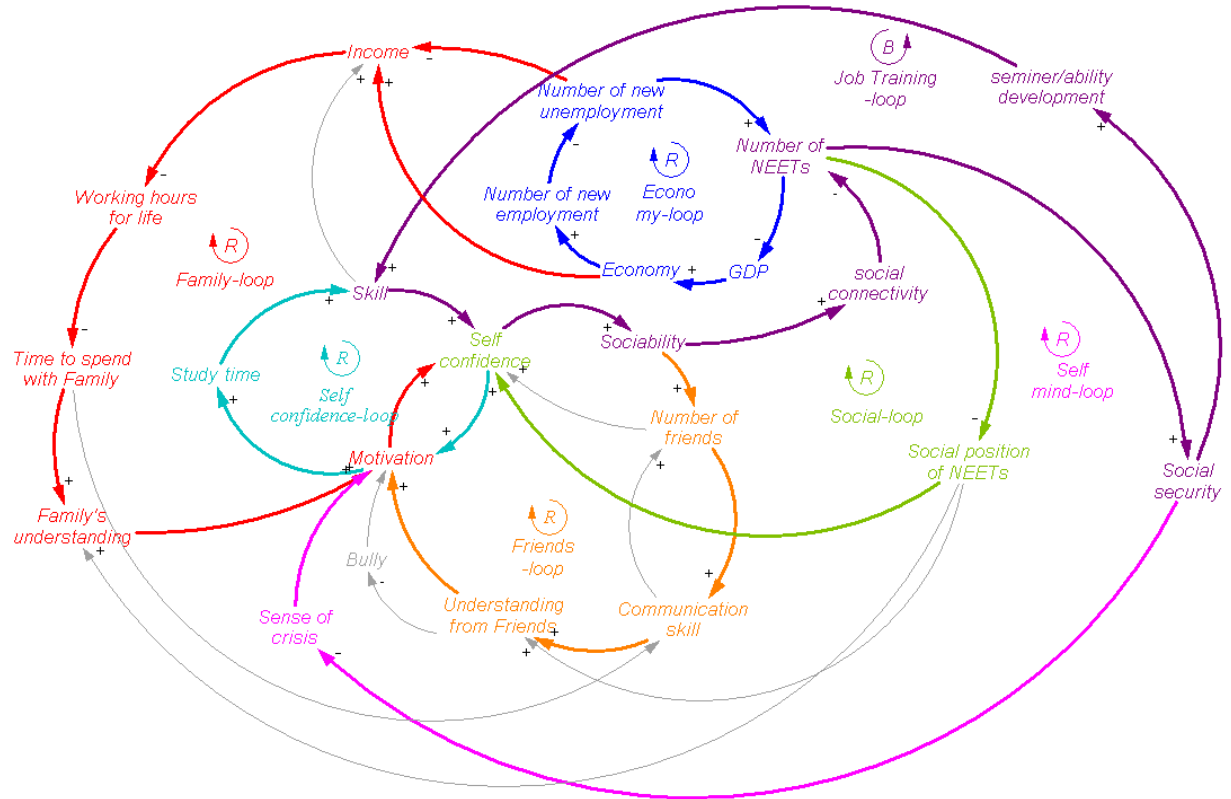


Figure 5. Causal Loop Diagram of Number of NEET

Identify Leverage Point and Systemic Intervention

In order to identify the leverage point, the CLD was rearranged in a hierarchical structure in an iceberg mode, with the internal elements being mind and skill, interaction, and society (Figure 6). According to the result, motivation, self-confidence, and sense of crisis are located in the deepest layers in a relationship, which affects the positive feedback loops for the number of NEETs. From the CLD indicated in Figure 5 and its hierarchical structure shown in Figure 6, a leverage point was analyzed based on the criteria that the element overlaps a positive feedback loop and is located in the deepest layer of the iceberg model. The leverage point was decided by the consent of all the social entrepreneur members as the agents of the stakeholders. Motivation was determined to be the leverage point for unemployment problems for youths, affecting four of the positive feedback loops among the seven.

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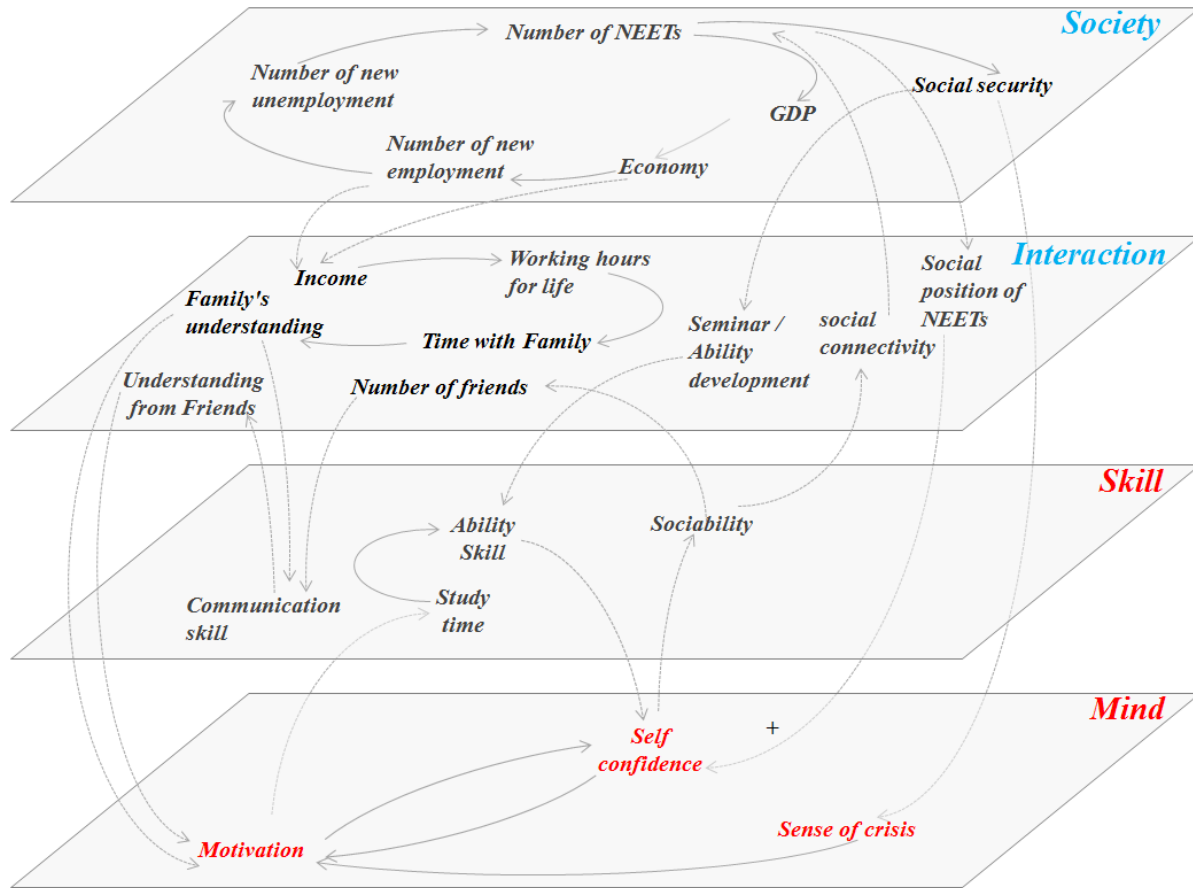


Figure 6. Structured causal loop diagram for the number of NEETs

Develop Action Plan

The result of the analysis of factors affecting the number of NEETs indicated that motivation is the leverage point of the social issue. Thus, the social entrepreneurs brainstormed the following question: “How might we rekindle the NEETs’ motivation?” These ideas are then structured hierarchically based on enabler relationships (Figure 7). The hierarchical structure can be mainly classified into internal or external elements. The former first internal layer is self-confidence and the latter first external layer is recognition from others. Self-confidence consists of social skill and the experience of success. Each element was factored in the same way. Vertical relationships are decided by enabler relationships, and then the factored elements indicate more concrete measures. Moreover, the internal structure of the hierarchy relies on Maslow’s hierarchy of needs; motivation for self-fulfillment will be improved if someone can be satisfied with social needs/love and belonging and esteem.

Next, the most effective solution can be abstracted by means of a simulation using BBN so that all members can quantitatively determine their consensus. Figure 8 shows the result from quantifying the relationships among the elements into the hierarchical structure of the majority rule by the participants as shown in Figure 7. For instance, social skill consists of both internal and external factors: that is, communication skill and the participant combined with social activity and communication time. Probability is then indicated by a combination of those elements. A simulation was run based on the results, and the most effective measure for maintaining and improving motivation was considered. Finally, it was decided that the measure is participating in

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social activities. In addition, “how participation in social activities can be improved” was factored so as to abstract the elements that prompt people to take part in the social activities. Fig. 9 shows their hierarchical structure. In a similar way, a relationship of cause and effect concerning the causal elements for participation in social activities was divided into internal and external elements, and organized. The first layer consists of the physical condition of the participants and the opportunity for social activities. Thus, the first step of the participations for social activities and effective factors to maintain and improve the motivation is both to be in good shape physically and to have interesting social activities in which to participate (Figure 10).

At this learning step, BBN was repeated twice to develop the action plan. As a result, the most effective solution was found to be social activity participation. Additionally, the activity enabler was designed to consider what kind of social activity might be interesting to participants. The Ministry of Health, Labour, and Welfare spent 33.5 billion yen on job training and job support for unemployment and only 2.2 billion yen in support of social participation for all youth. According to the social design solution for new NEET issues, it is apparent that the expanded ELLab methodology provides us with a new point of view in terms of a solution for this social issue.

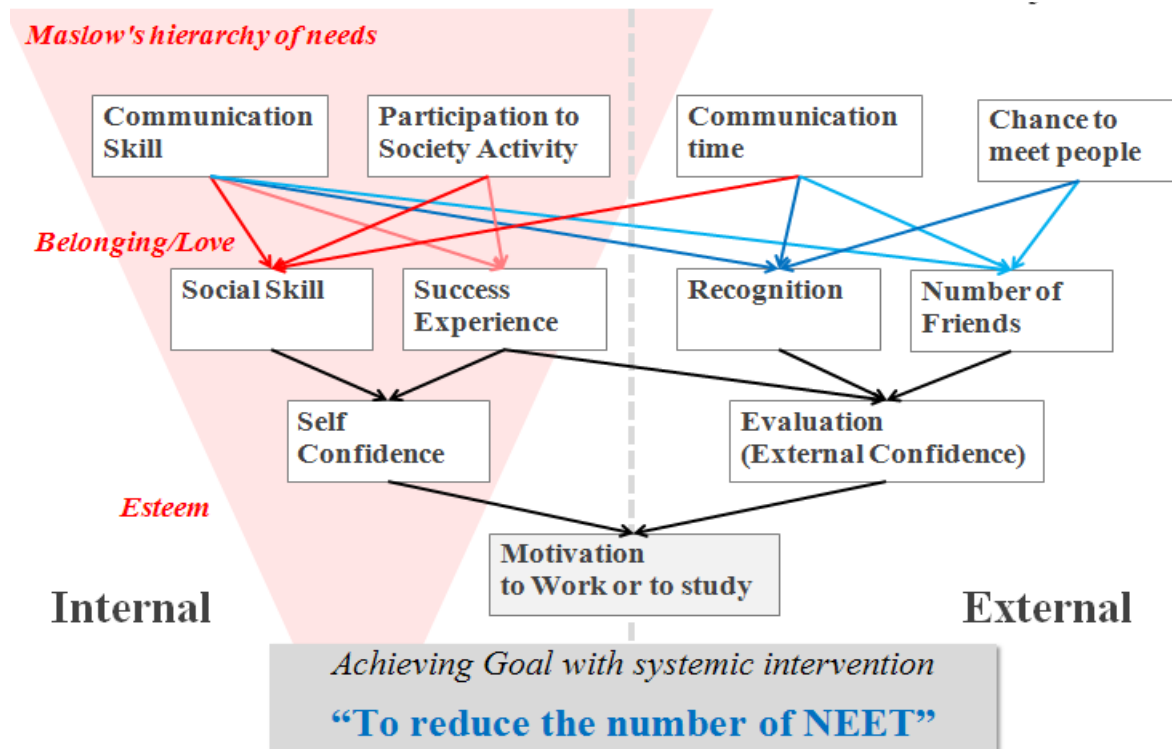


Figure 7. Element structure for motivating NEETs

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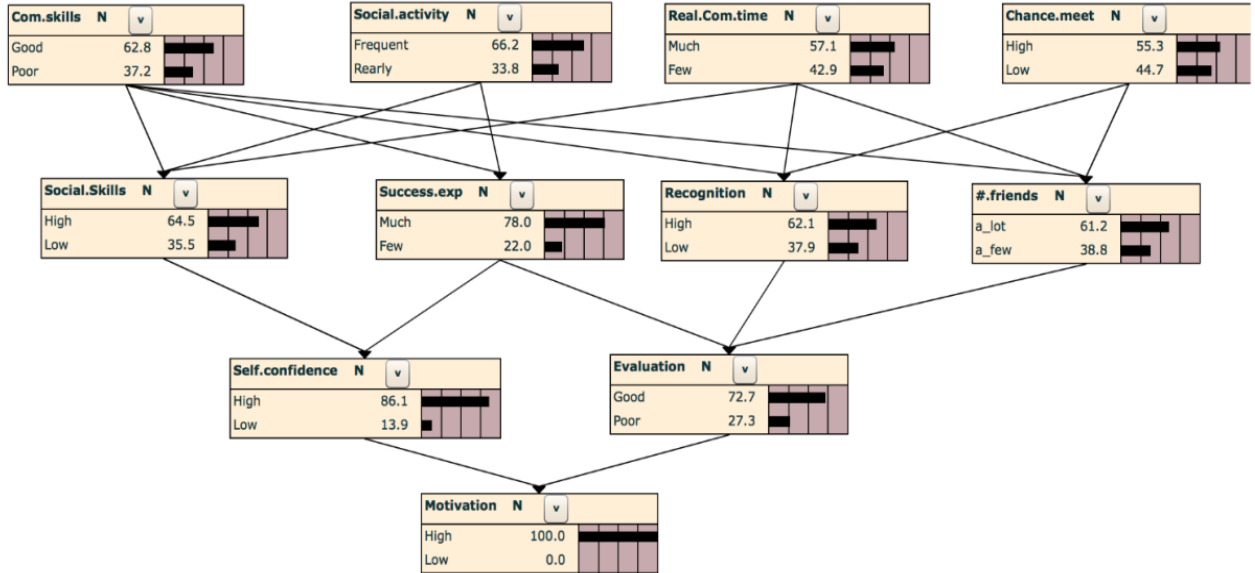


Figure 8. BBN to motivate NEETs to work or to study

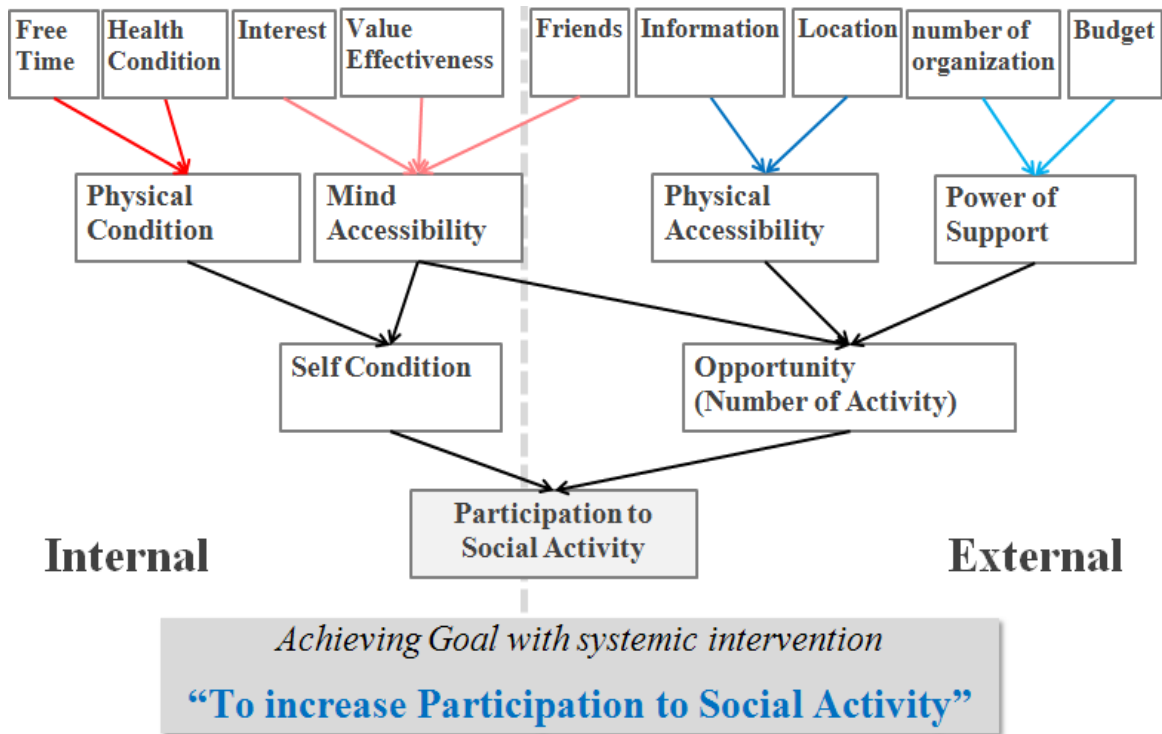


Figure 9. Element structure for participation in social activities

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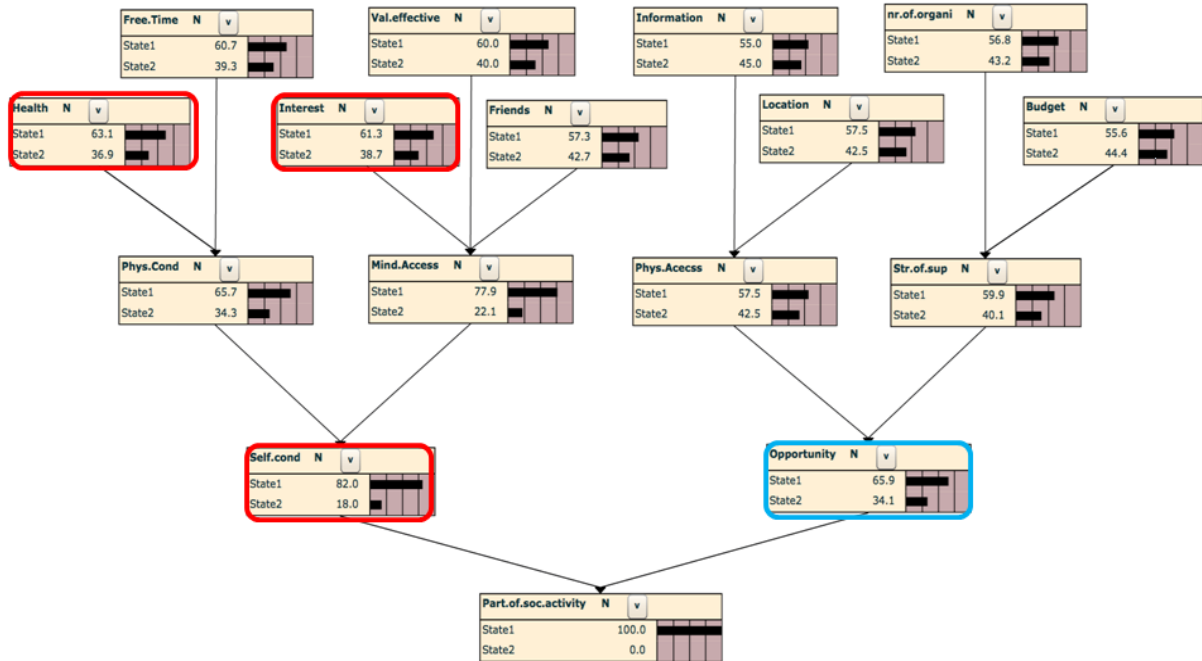


Figure 10. Bayesian Belief Network for helping people join social activities

Implementation and Reflection

The objective of this research was to propose a new model and to indicate a social design that combines propulsive and consensual solutions for a social issue. Therefore, implementation and reflection could not be included in the objectives. However, a feasible solution for this social problem may be found through a continuous cycle consisting of learning, implementation, and reflection using the solution obtained in this study.

CONCLUSION

The purpose of this research was to provide a model for a social design that combines propulsive and consensual solutions for the chosen social issue by gaining the advantages of both social entrepreneur and PSA methodologies. A model using the expanded ELLab was provided; social entrepreneur members become the “agents” of stakeholders through learning about and reflecting on stakeholders’ mental models and then using the systems thinking approach for their social design. Using this methodology in a case study, a team of social entrepreneurs sought for solutions to the NEET issue in Japan, which is an extremely complex problem. Consequently, the researchers validated that use of an extended ELLab model can be an effective way to solve a complex social issue with propulsive capability.

In conclusion, it is possible for someone to lead in discovering an objective and quantitative solution, compared to the model in which stakeholders directly take part in the decision-making process. This approach makes it possible to define the boundary of the problems and to perform demand triage smoothly, which is a challenging task in participation system analysis.

Our research indicates that the agents of stakeholders can create a social design that reflects the mental model obtained from stakeholders by means of external learning, through subsequent

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reflection and internal learning. The most significant aspect that determines whether social entrepreneurs can be agents of the stakeholders is how faithfully they can reflect the stakeholders' mental models.

Finally, this extension of the application for social design makes it possible for people who are interested in social issues to take part in social design as the agents of the stakeholders. Thus, this model is highly valuable for the present society, which requires social design for resolving its complex issues.

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