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Research and Development of Technology and Innovation for Quality of Life Improvement in Sakon Nakhon Province Communities

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Abstract

Sakon Nakhon province community life can't be examined the quality of Geographical Indication (GI) such as food, beverages, indigo dye, rubber and herbal compress. We proposed the easy method for solving these problems by using the smart technology and innovation. The coaching system is very important for the community research group [1 – 5] and grant project for improving Sakon Nakhon province community life problems. We are community members of technology and innovation research group from the faculty of science and technology, technology industry, management science, education and center of excellence on alternative energy (CEAE). We are experts in different fields to develop innovation of supplier, retailer and more useful for the quality of life in Sakon Nakhon province communities. The innovation and knowledge were integrated the science & technology & art & engineering & mathematics (STAEM) for young scientists of in the high schools of Sakon Nakhon Province.

Keywords: invention for life; technology in the future; science communities

1. Introduction

We need to make the apparatus examining the quality of the quality of GI for safety life, business plan, feasibility study and competency in marketing in Sakon Nakhon province community. Our grant will support following projects:

1. Modeling of the instrument for detecting, flavors and additives of Sakon Nakhon wine by piezoelectric technology.
2. Research and development of technology and innovation for quality assurance and value-added Indigo dye.
3. A tape dispenser with photo processing techniques creating for lubber.
4. Research and development of herbal compress with thin film technology
5. Integrated technology and innovation of indigo thin films, sensors, piezoelectric and thermoelectric with STEAM education in the high schools of Sakon Nakhon province.

2. Methodology

We are technology and innovation group and have held meetings to brainstorm about problems by using "problem tree model" for writing research proposal; research/discussion, fabricating prototype and publishing our work for users and developing the commercial scales in Sakon Nakhon province are shown in Fig. 1. The grant project is running around 3 years as following in Table 1.

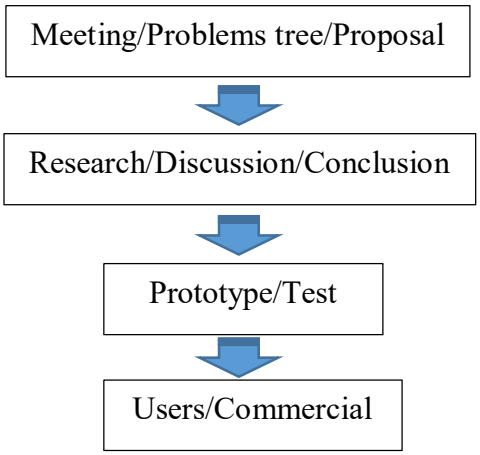

Fig. 1 Diagram of research process

Table 1 The time and process of grant project

Time (year)	Process
1th	1. Upgrading technology and area innovation by enhancing the capacity of the innovator in the local areas. To develop innovative areas at the research level such as resource management of technology and innovation members. To provide area innovation and promote community participation. The goals are growing innovation at the regional levels. The cooperation of Sakon Nakhon Rajabhat university - communities in Sakon Nakhon province to continuous technological development and innovation and used in the local areas of Sakon Nakhon province. 2. Promote technology and innovation throughout the value chain from the suppliers, retailers and users by accelerating, promoting and supporting the development of technology and innovation businesses in line with government policies. By working in partnership with both domestic and international partners. To drive the development of innovation in the manufacturing sectors, the social sectors and the communities as a whole. To be able to adapt to the country's development direction. We want to drive the country's development strategy for the next 20 years, laying the foundations for changing the development and driving the target industries of the government to set the target industries. It can also be a great influence on the long-term and sustainable development of the country's economy. We interested in research and development: 1. Modeling of the instrument for detecting, flavors and additives of Sakon Nakhon wine by piezoelectric technology 2. Research and development of technology and innovation for quality assurance and value-added Indigo dye. 3. Creating a tape dispenser with photo processing techniques 4. Research and development of herbal compress with thin film technology 5. Integrated technology and innovation of Indigo dye, thin films, sensors, piezoelectric and thermoelectric with STEAM education for high schools.
2nd	1. Develop technology and innovation capabilities to build the technology and innovation of the innovator, organize innovation, entrepreneurs, NGOs, state and state enterprises. To upgrade technology and innovation by using a variety of tools designed to meet the different needs of the recipient from the assessment of the ability to understand the potential of various management consulting and appropriate to the needs in the development situation of communities and areas of Sakon Nakhon province. 2. Build a network of technology and innovation by conducting networking activities with government agencies, NGOs, universities, and communities, leading to cooperation, linking and co-creation. The cause of the knowledge talent development and use of resources is limited. This will strengthen the ecology, technology and innovation of Sakon Nakhon Rajabhat university in various dimensions, such as linking knowledge between various sectors leading to the innovation business. Strengthening the network and participation of network members, enhancing the technological and innovation potential of networks and network members.

Table 1 (Continue)

Time (year)	Process
3rd	1. Encourage and stimulate technology and innovation markets by creating opportunities for the diffusion of technology and innovation and encouraging technology and innovation to thrive in the marketplace. It also enhances the opportunities for innovators and operators of technology and innovation to expand and expand their innovative-based products. The development of technology and innovation are promoted mechanism in various forms, such as creating new marketing channels to market the technology and innovation. Develop tools, support mechanisms that accelerate the distribution of innovation and expand the product base, innovation, development, cooperation, and international alliances for investment and technology transfer. 2. Drive technology and innovation with information technology by the application of information science and pull out new knowledge. Analysis of the meaning of information and use the data to create a competitive advantage for the competition. This leads to strategic and policy-driven decision-making by the main goal. It creates innovative tools that are effective in analyzing and evaluating innovative systems, developing support mechanisms that have been developed to cover and modernize the strengthened. In addition, the development level of the technology and innovation system of Sakon Nakhon Rajabhat university community, society and the nation.

3. Outputs

1. The prototype quality measurement system of Maobemy wine and can be developed commercially.
2. Find out how to measure or discover the quality indicator of the Maobemy wine from the sensor.
3. Measurement techniques of Maobemy wine internal compounds by measuring complex resistances.
4. The guideline to promote the production of standardized Maobemy wine.
5. Transfer knowledge of the Maobemy wine quality measurement system to the cooperative group.
6. Quality inspection equipment for Indigo dye
7. Product manual quality inspection equipment for Indigo dye
8. Advertising media sites such as multimedia, brochures, infographic graphics.
9. Acceptance of the use of indigo dyeing with the indigo fabric market
10. Networking with external organizations
11. Other indigo products such as glass, water hyacinth, peppermint, garlic
12. Quality improvement of indigo dyed fabric to commercial standards such as meat quality measuring instrument.
13. Create value for the market, such as modern looks branding, packaging.
14. Innovative Information Systems for Quality Inspection and Value of Indigo dyeing product
15. MICE Business (Meetings, Incentive Travel, Conventions, Exhibitions: MICE)
16. Prototype automatic rubber cup cube
17. Knowledge of automatic tire quality control system.
18. Bring the automatic tire check system to the communities.
19. Innovative herbal compress with innovative prototypes.

20. Know the efficacy of the herbal compress.
21. It can be used as a guide to the application of first aid and treatment of traditional Thai medicine.
22. Apply knowledge that has been applied to the properties of herbs for the treatment of Thai traditional medicine in the local community to create more profitable occupations.
23. Study design and test equipment for thermocouple for learning a full study for physics teachers and commercially.
24. Research articles published in national and international journals.

4. Outcomes

Table 2 The outcome of the project

Details	Quantity	Quality
1. The prototype system for measuring the quality index of Maobemy wine	Prototype of sensor master kit has a processor and integrated display and detector can be portable.	The index of the Maobemy wine quality indicator can be indicated: 1. Concentration 2. Viscosity 3. Sour taste
2. Publish a wine quality meter for Maobemy wine		Cooperatives have been known and used to measure the quality of the Maobemy wine
3. The development of a wine quality measurement system for commercial Maobemy wine		The guideline for the development of a quality Maobemy wine
4. Indigo Dyeing Products	The government agencies use the standard group of indigo dyed fabric manufacturers not less than 2,000 persons per month.	1. Can classify dyes. 2. Can be used to set the standard price of indigo dyed products. 3. Stakeholders can use the quality control tool for indigo dyeing products
5. Innovative information systems, quality assurance and value-added products information systems that can manage information, innovation, quality assurance, and value-added products	Release of knowledge from the research program of not less than 2,000 people per month, users can access the information system	
6. Prototype of automatic rubber cup cube	Checking automatic rubber cup cube 500 pieces of rubber per hour	Quality of rubber cup cube and value-added rubber
7. Prototype of intelligent herbal compression		Prototype Set through evaluation of applications by relevant agencies
8. The teaching materials for STEAM education	High school students in Sakon Nakhon province >500 persons	High school students are interesting/understanding the science & technology & art & engineering & mathematics

5. Impacts

1. The prototype system was measured the quality index of a Maobemy wine that consists of a display processor, a detector that can indicate the index value of a wine, separated by the grade of wine. Maobemy juice processing cooperative of Sakon Nakhon province and the production process of the cooperative group have seemed compliant with GAP and GMP/HACCP.
2. The innovations were trained Maobemy juice processing cooperative of Sakon Nakhon province on the use of to measure the quality index of mull Maobemy wine and provide knowledge on the use of innovative wine quality indicators to measure the quality of wine. Improving the quality of the wine produced by the cooperative in Sakon Nakhon Province and
3. The development of a Maobemy wine quality measurement system for commercial wine and guidelines for the development of wine quality monitoring systems for general and commercial wineries.
4. Quality indigo dyeing machine classification of dyes can be used to set the standard price of indigo dyed fabric. Government agencies use the standard group of indigo dyed fabric manufacturers. Community enterprise/One Tumbon, One Product (OTOP) group, provincial commercial office provincial office of industry provincial agriculture office consumers/buyers receive fairness in the purchase of dyed fabrics nature and naturally dyed products are standard.
5. Indigo products with other materials such as change cooler glass, water hyacinth, peppermint, garlic, etc. The new indigo product created a new career group to increase the value of indigo products with other materials. Promote proper body mass index by homegrown local vegetables to earn income. Enterprise community group/OTOP, provincial office of industry provincial agriculture office and the provincial tourism office, consumers/buyers and manufacturers/sellers of indigo dyeing products have increased their income.
6. Innovative information systems, quality assurance and value-added products information systems that can manage information. Knowledge dissemination from the research project into community enterprise/OTOP group, provincial commercial office provincial office of industry provincial agriculture office and the provincial tourism office, consumers/buyers and manufacturers/sellers of indigo dyed products. People have the knowledge to decide to buy indigo dyed products.
7. Prototype automatic rubber cup cube Cup-breaking system and do not pass the criteria. Rubber plantation owners in Sakon Nakhon mueang district. The farmers who made rubber cups of quality rubber prices.
8. Herbal compressor intelligent prototype is an innovation that applies local wisdom to innovations that are used in place of or in combination with traditional hot compress. Provincial health office district health promotion office, district health promotion hospital spa business and local community goals local wisdom is applied to the technology or innovation that is created appropriately.
9. Training with the use of intelligent herbal compresses and knowledge about the use of intelligent herbal compresses to local communities, provincial health office, district health office sub district health promotion hospital and local community groups. In addition, increase local wisdom of local target communities.
10. Guidelines for development of intelligent herbal compress for commercial purposes. The development of intelligent herbal compress community health district health promotion hospital and guests to commercialize.
11. A set of learning, testing, and testing of thermomechanical devices make students, teachers, and others interested in alternative energy learning and can be used to real useful in the future.

6. Summary

We have developed the technology and innovation of the instrument for detecting, quality assurance, tape dispenser, herbal compress and STEAM education to help people or value-added OTOP in Sakon Nakhon province.

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