

Traditional Knowledge Management (TKM) through Biosprospecting: Mainstreaming Scientific Research Trends and Techniques for Inclusive and Sustainable Education

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ABSTRACT : Traditional knowledge management (TKM) or indigenous knowledge management (IKM) is essential in preserving traditional knowledge through resource and biodiversity management along with biosprospecting putative medicinal plants deemed to have medicinal uses and benefits for knowledge literacy and product development. This study was documented to determine the significance of seminar-workshops on scientific researches in preserving and updating traditional knowledge through biosprospecting thus, strengthening traditional knowledge. Results revealed that all students strongly agreed that the conduct of seminar-workshops is essential in safeguarding traditional knowledge which is nowadays at stake due to modernization. Results further implied the need to conduct more seminar-workshops across the region especially in the indigenous and local communities to preserve the traditional knowledge and to foster inclusive and sustainable education.

Keywords: IKM, seminar-workshop, resource management, indigenous/local communities

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INTRODUCTION

Over the years, indigenous knowledge has made huge contributions especially in the realm of bioprospecting potential medicinal plants for pharmacological applications. It has made positive contributions in the field of research and development towards achieving good health and well-being (Goal 3) for sustainable development (Sarkhel, 2017).

Traditional knowledge (TK) becomes the integral part of the cultural identity of a community. It is considered community-based which has been generated with time through the process of sharing and learning of the members of a particular community and society. Ultimately, it is found to play a pivotal role in achieving sustainable development due to its direct connection to resource management and biodiversity conservation (Donato-Kinomis, 2016). Capacity building through the conduct of seminar-workshop on the current research trends and techniques is one of the fundamental factors of conserving traditional knowledge as adequate establishment of both would create an avenue for harmonious existence, coordination of thoughts and ideas, and ensure knowledge integration (Onyeaghalaji & Igberaese, 2010).

In the case of Mamasapano National High School STEM students and science teachers who all belong to Maguindanaon tribe, part of the wider Moro ethnic group, traditional knowledge has all been part of their daily living however, students and the local communities have no access to update their knowledge and understanding in the realm of research due to lack of funds, access, resources, and programs to support traditional knowledge management. Mamasapano National High School is a public high school specifically located at Poblacion in the municipality of Mamasapano in the province of Maguindanao, and in the region of ARMM – Autonomous Region in Muslim Mindanao.

Nonetheless, because indigenous knowledge is tacit, indigenous groups across the world face continual risks to its survival since many of the countries across the globe have exploited their knowledge base in the pursuit of economic growth (Pant & Moorthy, 2013). Hence, there is a robust need to safeguard and protect traditional knowledge along with strengthening it through the conduct of seminar-workshop which features series of training and laboratory workshops on the current research trends and techniques of bioprospecting potential medicinal plants to add a breadth of understanding for research sustainability and to rekindle the successive mortality of traditional knowledge for scientific literacy, thus will inspire the indigenous and local community, particularly in Maguindanao province in the continuous quest for health and medicine breakthroughs to augment human development.

In the light of the realities aforementioned above, this study was documented to strengthen the indigenous knowledge management among the

STEM students and Science teachers of Mamasapano National High School who all belong to the Maguindanaon tribe through the conduct of seminar-workshops on the trends and techniques in research. The output of this study was based on the survey questions which served as an evaluation after the conduct of the seminar-workshop.

THEORETICAL REVIEW

Indigenous Knowledge Concepts and Context

Historically, indigenous knowledge has been ignored, disregarded, or overlooked in many parts of the world (Britz & Lor, 2003). The increased focus on indigenous knowledge by educational institutions and development organizations has not yet resulted in a shared understanding of the idea of indigenous knowledge. There has been minimal study that pertains to management of indigenous knowledge like the study conducted by Ngulube (2002) and Muswazi (2001) on the challenges and opportunities in the knowledge management era and perspectives on indigenous knowledge management in Swaziland respectively.

Indigenous knowledge is specific to a particular culture and civilization. It is the information and experiences possessed by a community and developed since time immemorial by individuals living in particular local communities, and is often passed down orally from many generations as it is locally used in a variety of fields, to include fishing and agriculture, education, health, risk and disaster management and home management. In 1987, the Rio Conference on Our Common Future publicly acknowledged IK as a crucial construct to Sustainable Development. Because of its very local and long-term perspective, indigenous knowledge is currently most successfully utilized in development initiatives as a source of new ideas (Huysamen, 2003; Rouse, 1999).

Nowadays, indigenous knowledge (IK) has become an oft-cited phrase all throughout the world. It has been seen from many viewpoints, but it is often regarded as local or traditional knowledge that indigenous peoples have successfully passed down by word of mouth from past generations. According to Warren (1991), indigenous knowledge (IK) is information that local people use to earn a living in a specific setting. Native specialized information, conventional ecological information, rustic information, and local knowledge are phrases used to communicate this idea in the field of economical turn of events. Additionally, as cited by Johnson (1992), indigenous knowledge is a corpus of information

gathered by a group of people over generations of direct interaction with nature. In general, such knowledge develops in the local environment, particularly fitted to the demands of the local people and conditions. It is also creative and innovative, always combining external influences and internal developments to handle new issues.

Warren (1989) argued that traditional or indigenous knowledge was borne out by local communities that is exclusive to a certain area, culture, or civilization. For Rajasekaran (1993), TK/IK is an organized body of information accumulated by the local inhabitants via the acquisition of experiences, informal experimentation, and deep awareness of the environment in a certain culture. Moreover, for Haverkort & De Zeeuw (1992), TK/IK is the real knowledge of a specific person that redirects traditional experiences as well as more recent encounters with new technology. It is also demarcated as a nonorthodox discipline that concerns certain parts of philosophy but focuses on principles, practices, and machineries produced outside real access from the contemporary, formal, scientific setting.

Implications of Traditional Knowledge

Indigenous or traditional knowledge is straightforward and pragmatic. It links the existence of humanity with the very integrity of nature and its life-sustaining components. It addresses various socio-economic situations related to the environment and provides practical solutions to social challenges. Indigenous knowledge shapes people's worldview and guides them in their social, economic, political and spiritual life. It illustrates how cultural practices evolve as a result of people's efforts to adapt to their circumstances. When people fail to meet specific challenges, it gives them the opportunity to better understand the human condition (World Bank, 1998).

Ulluwishewa (1993) stressed that the influence of indigenous knowledge on local empowerment and development promotes self-sufficiency and strengthens self-determination, which makes it important. The inclusion of indigenous knowledge in research, development and management plans gives legitimacy and credibility to the views of domestic and foreign experts, fosters cultural pride and thus, can create incentives to solve local problems using indigenous knowledge and resources. In addition, indigenous peoples can provide important information regarding the local ecosystem and how to properly manage its natural resources. The ongoing worldwide environmental emergency, and the discernment that over-abuse of normal assets in view of ill-advised perspectives and advancements is one of the causes, has stirred external interest in native information frameworks. Researchers progressively comprehend that native people groups have dealt with the climate wherein they

have resided for ages, frequently without making significant harm to local ecosystems (Matowanyika et al., 1995).

Many individuals feel that indigenous knowledge may be used to build alternative ways to resource management. Native information frameworks and advances have been shown to be socially alluring, financially attainable, and reasonable, with little gamble to rural farmers and producers, and, most significantly, to conserve resources. In certain circumstances, present research is insufficient, and simpler technologies and approaches must be employed. Learning from indigenous knowledge may thus increase awareness of local realities and create a constructive environment for community-helping efforts. Furthermore, the utilization of indigenous knowledge guarantees that the end user of specific programs is involved in the creation of technologies relevant to their requirements (Warren & Rajasekaran, 1993).

METHODOLOGY

This study follows the fashion of a descriptive analysis by interpreting the data result of the post-evaluation survey conducted to the respondents. The seminar-workshop entitled “Capacitating Students into the Abyss of Sustainability through Research and Development” was conducted through the request of the Science teachers of Mamasapano National High School as part of their Immersion Program for Senior High School Students who pursued the Science, Technology, Engineering, and Mathematics (STEM) course. A letter was sent to us by the requesting party with the signature and approval of their principal. The authors initiated the seminar-workshops which featured lectures, training, simulation, presentation, focus group discussion, actual laboratory experimentation, and the like. The program took place for two (2) days at OND Center, General Santos City.

Respondents

Forty-four (44) STEM students from Mamasapano National High School participated in the program with the supervision of three (3) STEM teachers. During the 2-day seminar-workshop, the students were assisted by their teachers in brainstorming, preparation, presentation, and laboratory works.

Seminar-Workshop Intervention and Implementation

The 2-day program featured lectures of various topics like Scientific Method, Identification of Current Research Trends, Research for Sustainable

Development, Research Techniques, Statistical Analysis, Bioassays and Science Investigatory Projects. Moreover, the seminar-workshop featured a concoction of brainstorming, group sharing, problem identification, species identification and literature review, presentation, simulation, conduct of bioassays like antimicrobial, anti-inflammatory, toxicity, angiogenicity, and haemostatic tests. Prior to the seminar-workshop proper, students were already primed to bioprospect and bring plant species deemed to have medicinal value and properties in their local community based on their traditional knowledge. During the first day of the seminar-workshop, plant species were identified using a taxonomic key and students were given ample time to read studies and literature about the plant species. Based on their readings, students were able to formulate the problem and perform research bioassays depending on their formulated topics.

Questionnaire/Post-Evaluation

At the end of the 2-day seminar-workshops, STEM students with their teachers were given ample time to answer the questionnaire which served as an evaluation to assess their response regarding the activity. The questionnaire included ten (10) questions that pertained to the importance of seminar-workshops in their chosen track and in the preservation of traditional knowledge as cited by Onyeaghalaji & Igberaese (2010) with some modifications.

RESULTS

Based on the consolidated response of the respondents, it was found out that all Mamasapano National High School STEM students and teachers who took part during the seminar-workshop **strongly agreed** that they became more knowledgeable and updated about the medicinal uses and properties of the traditional medicinal plants found in their locality ($\bar{x}=4.95$), and became aware of the techniques and bioassays used in research ($\bar{x}=4.93$).

Moreover, all respondents **strongly agreed** that traditional plants should be protected for bioprospecting necessary for research and development ($\bar{x}=5$), local and indigenous communities need to update their knowledge about science and research ($\bar{x}=4.95$), local and indigenous communities need trainings and seminars to better conserve the biodiversity especially the floral species ($\bar{x}=4.98$), and seminars, trainings, and laboratory workshops are essential for students to help them be better equipped with their chosen track ($\bar{x}=4.98$).

Furthermore, they all **strongly agreed** that students who are part of the local and indigenous communities need more trainings and seminars about the trends in research ($\bar{x}=4.93$), seminar-workshops about research and development are needed to conserve traditional knowledge ($\bar{x}=4.95$), indigenous knowledge management through seminar-workshops is effective to fill in the knowledge gap

of the indigenous community ($\bar{x}=4.93$), seminar-workshops on research and development can help us achieve sustainable development ($\bar{x}=5$).

DISCUSSION

Results revealed that students showed positive response as they all strongly agreed about the importance of seminar-workshop in strengthening indigenous knowledge management. This coincides with the notion posited by (Langton & Rhea, 2003) that education is critical in the preservation and maintenance of Indigenous peoples' and local communities' knowledge. Moreover, Ma Rhea (2004) supported the argument by stating that education, via capacity building, plays a vital role in the preservation and maintenance of Indigenous and local community knowledge in both subsistence and capital-based economies. It is indisputable, therefore, that IK can contribute to sustainable development which takes into consideration the potential of the local environment as well as the indigenous population's experiences and wisdom (Magni, 2017).

CONCLUSIONS AND RECOMMENDATIONS

This study was documented and carried out to strengthen indigenous knowledge management (IKM) through the conduct of seminar-workshop in research for sustainable development. Throughout the years, the role of indigenous knowledge is crucial in the preservation of biodiversity and in bioprospecting potential medicinal plants for research and development. The students' responses strongly supported the idea that seminar-workshops help in preserving traditional knowledge and in strengthening the indigenous knowledge management in the local communities. It is therefore recommended to conduct more training and seminar-workshops apropos research trends to the local communities including the far-flung and rural areas in Mindanao to safeguard, preserve and update traditional knowledge. The planning and design of a capacity-building program that involves bioprospecting must be geared towards medicinal exploration and application, and plant diversity protection and preservation. Mainstreaming traditional knowledge in the area of research and development promotes inclusivity and sustainability in education.

FURTHER STUDY

The study can be a basis to explore the constructs and dimensions of traditional knowledge and how it can be properly managed based on the

explored factors for analysis. Other authors are encouraged to employ any type of capacity-building activities and methodologies that promote exploration and preservation of traditional knowledge.

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