

Integration of Indigenous Knowledge through Teachers Training & Technological Innovation: Status & Future Intervention

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Abstract:

In the current time one of the important areas of teaching learning process is the use of indigenous knowledge to make the learning process more interested and meaningful which talks about the use of culturally context specific, collective & holistic knowledge. The existing knowledge (indigenous knowledge) can be used more meaningfully or it can be developed when the user are familiar with, are well trained and able to use the appropriate technology to facilitate the learning. It was observed that to great extent in the current education system it is largely ignored and there is a need to incorporation it into the teaching learning process to make it more practical and holistic as per one of the concern area of National Education policy, 2020. In the era of technology to ensure the use and incorporation of indigenous knowledge in all the educational institutions it is essential that teachers should be familiar with the use of ICT.

Keeping in view the above in the present study an efforts has been made to study the current use of indigenous knowledge, familiarity & use of ICT by the teachers along with the training needs of the teachers of primary, secondary and higher secondary schools of Meghalaya state. The study was descriptive in nature, and a survey research design was used for collecting, analyzing and presenting the data. Simple random sampling technique was used to select a total of 440 respondents comprising 364 teachers two teacher from each school and 76 head teachers from 182 schools. It was found that the teachers in various levels of education, possess inadequate knowledge and they are not completely aware of the appropriate teaching-learning methods with reference to the use of indigenous knowledge. The lack of this information causes problems in imparting knowledge and information to the students. Therefore, it is vital for the teachers to possess adequate knowledge and be well aware of teaching-learning methods and instructional strategies with reference to the indigenous knowledge that they have and that they need to be put into practice. Improvements need to be bought about in the training programs of the teachers and it should be the integral part of their teaching practices.

Key Words: Indigenous, Teacher Training, Technology, Innovation, & Intervention

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INTRODUCTION:

The importance of indigenous knowledge based education systems depends on how it is enriching the current teaching learning process & related practices. The use of indigenous knowledge in teaching learning can help not only to promote the sustainable learning environment but also can make it more effective. Therefore, there is a need to ensure the integration of indigenous knowledge in education system, rather than using and following only conventional approaches.

In the fact moving changes & digital era the schools cannot remain detached from the innovation/ new trends and they have to make innovations as one of their main practice by using digital technologies and usage of indigenous knowledge system. As it is well approved that by developing the mastery of digital tools and processes to great extent the equity & quality in the education can be ensured but the schools are facing challenges in terms of preparing the digital tools/ applications and their availability to all the students without neglecting their regular educational responsibility.

In the current time the teacher education has been a matter of concern and there are number of issues and challenges faced in teacher education. Along with other developing the digital competences among the teachers is considered the unavoidable landmarks of any education system not only for today but for future also. The teachers must involve themselves in developing the digital competencies with special focus on digital tools and processes and mastering over the indigenous knowledge system. The mastery based practices will not only contribute for sustainable educational environment but also will enhance the teaching leaning systems in the schools. The use and improvements in indigenous knowledge in education system has been a subject of discussion at various levels. It is observed that along with digital competency in all the educational institutions there is a need to ensure that teachers should be adequately prepared in the domain of indigenous knowledge and how it can be promoted by using technology.

It is essential to acquire an understanding of the issues and problems in the usage of indigenous knowledge and formulated a model/approach to solve the problems & issues. The most important aspect is that it is essential that teachers need to be well-prepared in terms of the subjects that they are teaching and where the indigenous knowledge can be incorporated. Keeping in view the above in the present study efforts has been made to know the current status of ICT & indigenous knowledge used by the teachers in teaching learning process, major problems faced along with the measures required to improve the teacher education

Need and Justification of the Study:

In India, indigenous people hold an extensive robust and deep indigenous knowledge. Use of indigenous knowledge in school curriculum, development of resources and pedagogy can serve multiple purposes. The inclusion of indigenous knowledge and perspectives in the course curriculum and teaching learning process is based on assumption that people's perspectives and knowledge can be the part of educational foundation and the indigenous knowledge contributes to the non-indigenous understanding of the traditional knowledge.

Now a day the educators are equally concern and understanding that the inclusion of indigenous knowledge in the curriculum can be a highly effective approach which can supports deep learning, inclusivity and will fits according to the learner's needs. Integrating of indigenous perspectives of teaching and learning can has an immense value in creating more responsive education system.

OBJECTIVES:

To study the teachers awareness and its usage of indigenous knowledge in Teaching and Learning in the class room.

METHODS & PROCEDURES:

The aim of the study was to investigate the teacher's awareness and its usage of indigenous knowledge in Teaching and Learning in the class room and ascertain their training needs for professional development. A survey research design was considered appropriate for collecting, analyzing and presenting the data.

Population:

The population of the study involves all the teachers of primary, secondary and higher secondary level. The state of Meghalaya has a total of 3540 primary and upper primary schools, 27 secondary and 19 higher secondary schools along with 43078 teachers at primary level, 394 at secondary level and 166 at higher secondary level.

Sampling Size and Technique:

In the present study, keeping in view the appropriateness of the time and other constraints, simple random sampling technique was used to select 177 schools from primary and upper primary, 03 secondary and 02 higher secondary levels. Thus a total of 182 schools were covered for the study. From the 182 schools, a total of 440 respondents comprising 364 teachers two teacher from each school and 76 head teachers were selected randomly. Thus the study was based on a total of 440 respondents.

Tools, Sources and Analysis of Data:

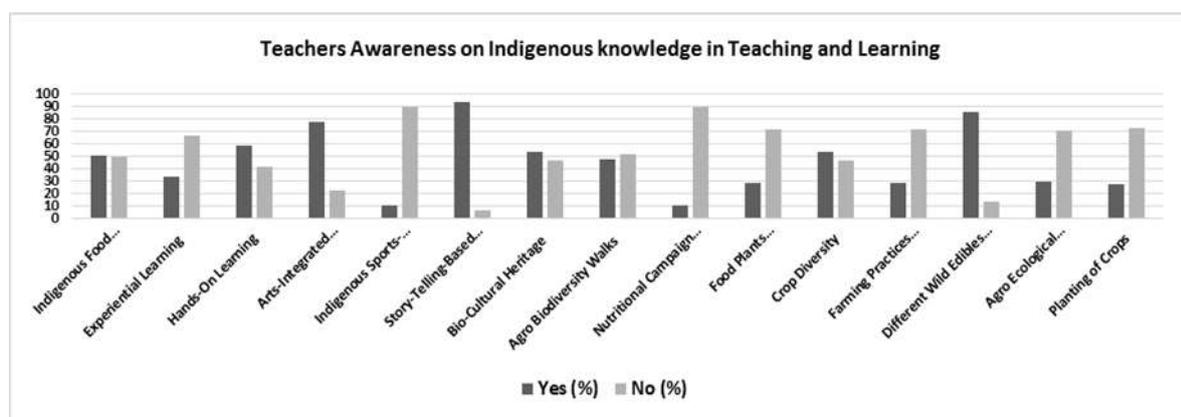
In the present study the questionnaire was used as a main tool of data collection. For collection of the data primary source was used. For interpretation of data quantitative analysis procedure was followed and simple percentage as statistical tool was used for the analysis of data.

ANALYSIS AND INTERPRETATION OF DATA:

The detail analysis of the data is presented below.

Table 1.1: Teachers Awareness on Indigenous knowledge in Teaching and Learning

Sl. No	Variables of Indigenous knowledge	Yes	%	No	%
1	Indigenous Food System (Nutritious Local Food)	221	50.23	219	49.77
2	Experiential Learning	146	33.18	294	66.82
3	Hands-On Learning	256	58.18	184	41.82
4	Arts-Integrated (Traditional Local Arts, Vocational Crafts)	342	77.73	98	22.27
5	Indigenous Sports-Integrated Education	46	10.45	394	89.55
6	Story-Telling-Based Pedagogy,	412	93.64	28	6.36
7	Bio-Cultural Heritage	234	53.18	206	46.82
8	Agro Biodiversity Walks	211	47.95	229	52.05
9	Nutritional Campaign for Children	47	10.68	393	89.32
10	Food Plants (Cultivated And Wild)	126	28.64	314	71.36
11	Crop Diversity	234	53.18	206	46.82
12	Farming Practices (Preparation Of The Soil, Selection Of Crop, and Pest Management)	127	28.86	313	71.14
13	Different Wild Edibles (Foraged, their Seasonality, and Benefits)	378	85.91	62	14.09
14	Agro Ecological Practices	129	29.32	311	70.68
15	Planting of Crops	120	27.27	320	72.73

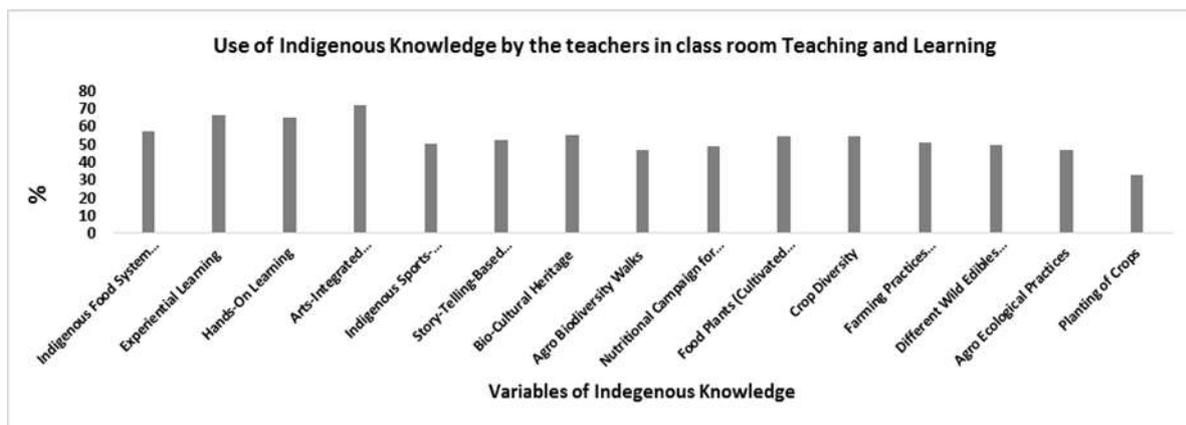


The Data regarding awareness about indigenous knowledge in teaching and learning was obtained from 440 teachers. It was found from the data that 93.64 percent of teachers have knowledge on Indigenous Story-Telling-based Pedagogy, 85.91 percent have knowledge on

different wild edibles, 77.73 percent have knowledge on Integrated arts which include traditional local arts and vocational crafts, 58.18 percent have knowledge on Hands-On Learning, 53.18 percent have knowledge on Bio-Cultural Heritage and another 53.18 percent have knowledge on Crop Diversity, 50.23 percent have knowledge on Indigenous Food System, 47.95 percent have knowledge on Agro Biodiversity Walks, 33.18 percent have knowledge on Experiential Learning, 29.32 percent have knowledge on Agro Ecological Practices, 28.86 percent have knowledge on Farming Practices (Preparation Of The Soil, Selection Of Crop, and Pest Management), 28.64 percent have knowledge on Food Plants which include Cultivated and Wild plants, 27.27 percent have knowledge on Planting of Crops, 10.68 percent have knowledge on Nutritional Campaign for Children, and 10.45 percent have knowledge on Indigenous Sports-Integrated Education.

Table 1.2: Use of Indigenous Knowledge by the teachers in class room Teaching and Learning

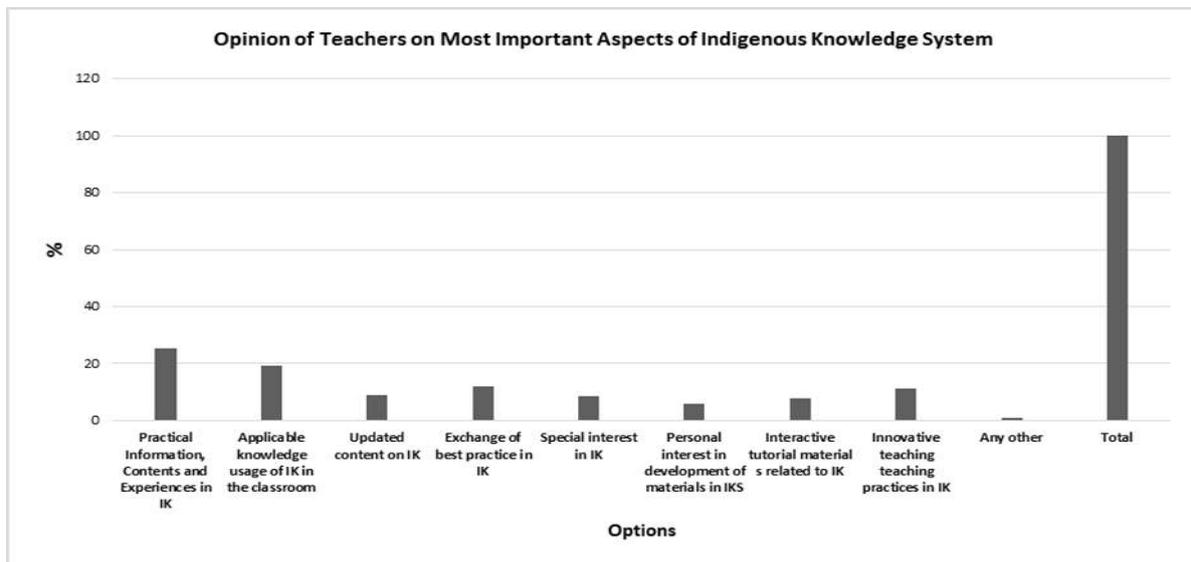
Sl. No	Variables of Indigenous knowledge	Frequency	Percentage
1	Indigenous Food System (Nutritious Local Food)	126(221)	57.01
2	Experiential Learning	97(146)	66.43
3	Hands-On Learning	167(256)	65.23
4	Arts-Integrated (Traditional Local Arts, Vocational Crafts)	246(342)	71.93
5	Indigenous Sports-Integrated Education	23(46)	50.00
6	Story-Telling-Based Pedagogy,	216(412)	52.43
7	Bio-Cultural Heritage	129(234)	55.13
8	Agro Biodiversity Walks	99(211)	46.92
9	Nutritional Campaign for Children	23(47)	48.94
10	Food Plants (Cultivated And Wild)	69(126)	54.76
11	Crop Diversity	127(234)	54.27
12	Farming Practices (Preparation of the Soil, Selection of Crop, and Pest Management)	65(127)	51.18
13	Different Wild Edibles (Foraged, their Seasonality, and Benefits)	187(378)	49.47
14	Agro Ecological Practices	60(129)	46.51
15	Planting of Crops	39(120)	32.5



The table 1.2 shows the use of Indigenous knowledge by the teachers in the class room. The data pertain to those teachers who have indigenous knowledge and use the knowledge in the class room teaching. It was found from the data that 71.93 percent use their knowledge on Integrated arts which include traditional local arts and vocational crafts, 66.43 percent use their knowledge on Experiential Learning, 65.23 percent use their knowledge on Hands-On Learning, 57.01 percent use their knowledge on Indigenous Food System (Nutritious Local Food), 55.13 percent use their knowledge on Bio-Cultural Heritage, 54.76 percent use their knowledge on Food Plants which include Cultivated and Wild plants, 54.27 percent use their knowledge on Crop Diversity, 52.43 percent use their knowledge on Indigenous Story-Telling-Based Pedagogy, 51.18 percent use their knowledge on Farming Practices (Preparation of the Soil, Selection of Crop, and Pest Management), 50 percent use their knowledge on Indigenous Sports-Integrated Education, 49.47 percent use their knowledge on Different Wild Edibles (Foraged, their seasonality and benefits), 48.94 percent use their knowledge on Nutritional Campaign for Children, 46.92 percent use their knowledge on Agro Biodiversity Walks, 46.51 percent use their knowledge on Agro Ecological Practices, and 32.5 percent use their knowledge on Planting of different Crops.

Table 1.3: Opinion of Teachers on most Important Aspects of Indigenous Knowledge System

Sr. No	Opinion of Teachers	Frequency	Percentage
1	Practical Information, Contents and Experiences in IK	112	25.45
2	Applicable knowledge usage of IK in the classroom	84	19.10
3	Updated content on IK	40	9.10
4	Exchange of best practice in IK	52	11.82
5	Special interest in IK	38	8.64
6	Personal interest in development of materials in IKS	26	5.90
7	Interactive tutorial materials related to IK	34	7.73
8	Innovative teaching practices in IK	50	11.36
9	Any other	4	0.90
	Total	440	100

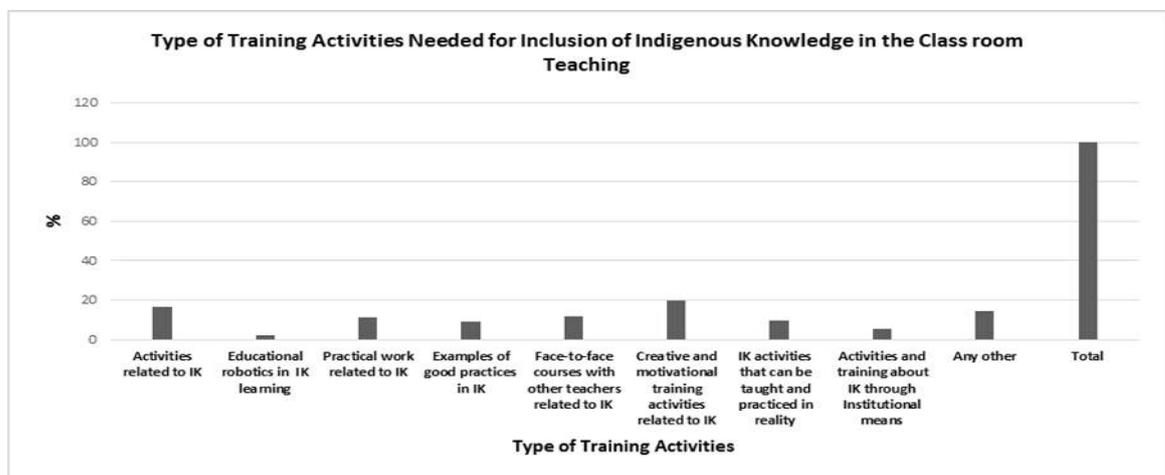


The table 1.3 shows the important aspects of an Indigenous Knowledge System as perceived by the teachers in teaching and learning system. The data reveal that out of total 440 respondents, 25.45 % teachers consider that the practical information, contents and experiences are most useful for teaching IK, whereas 19.10 % teachers opined that applicable knowledge usage of IK in the classroom is important. Further 11.82 % mentioned the exchange of best

practices on IK in teaching, 11.36 % felt that Innovative tutorial material and 9.10 % were in favour of updated contents important, whereas 8.64 % were in favour of having special interest in IK, 7.73 % mentioned about Interactive tutorial materials as important and only 5.90 % mentioned about their personal interest in development of materials in IK.

Table 1.4: Type of Training Activities Needed for Inclusion of Indigenous Knowledge in the Class room Teaching

Sr. No	Type of Training Activities	Frequency	Percentage
1	Activities related to IK	73	16.59
2	Educational robotics in IK learning	10	2.27
3	Practical work related to IK	49	11.14
4	Examples of good practices in IK	40	9.10
5	Face-to-face courses with other teachers related to IK	51	11.59
6	Creative and motivational training activities related to IK	88	20.00
7	IK activities that can be taught and practiced in reality	42	9.54
8	Activities and training about IK through Institutional means	24	5.45
9	Any other	63	14.32
	Total	440	100



The Information that come to fore from the responses on the type of training activities or experiences preferred by the teachers it was found that out of the total 440 responses, 20.00 percent of the teachers have their opinion on Creative and motivational training activities related

to IK, 16.59 % teachers stated their preference for the activities related to IK, 11.59 % teachers preferred face-to-face courses with other teachers, 11.14 % teachers mentioned the importance of practical work related to IK, 9.54 % teachers were in favour of the activities that can be taught and practiced in reality by the students, 9.10 % teachers stated their preference for examples of good practice in IK, while 5.45 % teachers stated about activities and training on IK through institutional means and 2.27 % teachers preferred for educational robotics in IK learning. 14.32 percent of the teachers were having allied opinion on types of training activities needed for Inclusion of Indigenous Knowledge in the class room teaching.

Table 1.5: Teachers Need for Professional Development for Inclusion of Indigenous Knowledge in Teaching and Learning

Sr. No	Teachers' Need for professional Development	Frequency	Percentage
1	ICT skills for teaching IK	40	9.09
2	Teaching of Indigenous knowledge in multilingual setting	38	8.64
3	Approaches to IK for individualized learning	32	7.27
4	Teaching Indigenous knowledge through cross-curricular skills	19	4.32
5	Ingenious knowledge & approaches for developing cross-occupational competencies for future	04	0.91
6	Pedagogical competencies in teaching IK	31	7.05
7	Subject understanding & integration of Indigenous knowledge in the curriculum	06	1.36
8	No Response	270	61.36
	Total	440	100



The result of the data reflected in the above table related to the teachers' need for professional development with reference to Indigenous Knowledge in teaching and learning reveal low score on various parameters like ICT skills for teaching IK, Teaching Indigenous knowledge in a multicultural or multilingual setting, Approaches to indigenous knowledge for individualized learning, Teaching IK through cross-curricular skills (e.g., problem solving, learning-to-learn), Approaches for developing cross-occupational competencies in IK for future, Pedagogical competencies in teaching IK, and Understanding of the subject field(s) knowledge and integrating the IK in the curriculum. All the above parameters yielded score less than 10 percent of the total.

MAJOR FINDINGS:

The Major findings of the study are as follows.

1. The data was collected from 440 teachers out of which 66% of the respondents were female and 34% were male. 64% of the teachers were in the age group of 20 to 30 years. It was observed from the data that more than 50 percent of the teachers have knowledge and awareness on Indigenous Story-Telling-based Pedagogy, different wild edibles, Integrated arts which include traditional local arts and vocational crafts, Hands-On Learning, Bio-Cultural Heritage, Crop Diversity and Indigenous Food System.
2. Of those teachers who have indigenous knowledge on various variables, more than 70 percent of them use their knowledge on integrated arts which include traditional local arts and vocational crafts in class room teaching, more than 60 percent of the teachers

use their knowledge on Experiential Learning and Hands-On Learning, more than 50 percent of the teachers use their knowledge on Indigenous Food System (Nutritious Local Food), Bio-Cultural Heritage, Food Plants which include Cultivated and Wild plants, Crop Diversity, Indigenous Story-Telling-Based Pedagogy, on Farming Practices (Preparation of the Soil, Selection of Crop, and Pest Management) and Indigenous Sports-Integrated Education.

3. It was observed that indigenous knowledge system as perceived by the teachers is one of the most neglected areas in teacher education. However the teachers need practical information, content development and experience in Indigenous knowledge, so that they are in a position to implement the Indigenous knowledge in the class room learning environment.
4. There were varied of opinion among the teachers with respect to training activities needed for inclusion of Indigenous Knowledge in the class room Teaching . The teachers were in favour of creative and motivational training activities related to IK, face to face courses with other teachers related to IK and practical work related to IK.
5. With regard to the teachers need for pprofessional ddevelopment for inclusion of indigenous knowledge in teaching and learning, it was observed that less than 10 percent of the teachers felt the need of professional development in each of the following domains of IK viz: ICT skills for teaching IK, Teaching IK in a multicultural or multilingual setting, Approaches to IK for individualized learning, Teaching IK through cross-curricular skills (e.g., problem solving, learning-to-learn), Approaches for developing cross-occupational competencies in IK for future, Pedagogical competencies in teaching IK, and Understanding of the subject field(s) knowledge and integrating the IK in the curriculum

SUGGESTIONS & RECOMMENDATIONS:

The study suggests the following recommendations and future course of action.

➤ **Role of the Government:**

Keeping in view the growing needs of education it becomes essential to provide ICT based in-service training with special focus on indigenous knowledge for teachers so that they can update their skills, knowledge and experience. Government also need to ensure that use & learning of indigenous knowledge must go with the pro educational advancement to compete with the developed world with the newest knowledge, information, and in a way relevant to the contemporary students.

➤ **Role of the School:**

The result of the study shows that the school system/environment does not support the use of indigenous knowledge & technology. So it is very much needed that there must be a indigenous knowledge friendly environment & techno based facilities in the schools which may include the computer labs facilities with internet, laptop/desktop facility, projector, a computer operator/technical expert in the school etc.

➤ **More Technology & indigenous knowledge based Programme:**

There are teacher who's hardly used the indigenous knowledge & attended any training programme regarding the use of technology. So there is a need to organize more techno based longer duration training programme with special focus on the use of indigenous knowledge.

➤ **Incorporation of indigenous knowledge & Technological Tool in Teaching Learning Process:**

The teachers still use blackboard as a material in the classroom to support teaching learning process. So there is a need to promote the use of smart board, handouts, projectors & PPT to support the teaching learning process. There is also a need of organizing more skill development programme which will develop the ability to use ICT in teaching learning process with more focus on indigenous knowledge.

RECOMMENDATIONS FOR SCHOOL CURRICULUM:

It has been established from different research studies that the current state of development throughout the world is unsustainable. The Indian way of sustainability is through its Indigenous Knowledge System. To become the knowledge leader in the world economy, India must show the world about the “Indian way” of doing things. Being one of the oldest civilization in the world, India with all its diversity of culture, language, social & ecological environment has promoted all dimensions of humanity not only for living in harmony with oneself but also with its own environment. The indigenous knowledge system of India are varied and are deeply rooted in Indian Shastras, Upavedas, Chaturdasha vidyas, Sahitya and avadhana kala, Vaastu and Shilpa shastra, Holistic medicine, Indian psychology and consciousness, Ship building, navigation and maritime traditions, Architectural Engineering, Economics and political systems, Mathematics and Astronomy, Astronomy and calendar systems, Sustainable agriculture and food preservation, Development and management of water resources, Conservation of biodiversity and ecological protection, Novel materials, metallurgy and material sciences and Preservation & documentation of manuscripts. Many of these aspects of the indigenous knowledge system are yet to be included in the school curriculum. Therefore the study makes a recommendation for Indianisation of Education system through NEP 2020 and make suitable curricula frame work for preserving and protecting the Indigenous knowledge system with the available technology.

CONCLUSION:

From the study it can be concluded that majority of the teachers in Meghalaya have knowledge and awareness on Indigenous Story-Telling-based Pedagogy, different wild edibles, Integrated arts which include traditional local arts and vocational crafts, Hands-On Learning, Bio-Cultural Heritage, on Crop Diversity and Indigenous Food System. The teachers who have indigenous knowledge use their knowledge on integrated arts which include traditional local arts and vocational crafts in class room teaching, knowledge on experiential learning and Hands-On Learning, Indigenous Food System (Nutritious Local Food), Bio-Cultural Heritage, Food Plants which include Cultivated and Wild plants, Crop Diversity, on Indigenous Story-Telling-Based

Pedagogy, on Farming Practices (Preparation of the Soil, Selection of Crop, and Pest Management) and Indigenous Sports-Integrated Education etc. in teaching learning process.

The study also conclude that the IK Programme should address the key skills required in the teaching learning process along with courses of social integration, equality, responsibility and integration of the new technologies in classroom. The training programme should be differentiated on the basis of practical aspects for the direct application in the school. Regarding the types of training activities preferred by the teachers, it is concluded that most of them prefer creative and selected motivational training activities Refereeing to the problem and challenges faced by the respondent in terms of use of technology the study concluded that major problems are related with the shortage of laptop/desktop, lack of technical expertise in the field, lack of internet facilities, projector & non-availability of operator. Overall it can be concluded that there is a need of organizing more in service training programme for the teacher educators with special focus on teacher teaching needs and there is also a need to develop the techno based ability among teachers. The school environment should be supportive so that the use of technology can be promoted at school level.

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