JOURNAL OF ALL INDIA ASSOCIATION FOR EDUCATIONAL RESEARCH

Volume 29 Number 2 December 2017

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Journal of All India Association for Educational Resaerch
Vol.29, No.2, pp.1-7, December 2017

SHOULD THE NATION INTRODUCE PROVISIONAL AND PERIODIC LICENSE FOR SCHOOL TEACHERS?

Sunil Behari Mohanty

INTRODUCTION

In 1985, The Challenge of Education document of the Government of India stated that:

> "It is widely believed, particularly by teachers themselves, that selection of teachers is not based entirely on merit. Consequently, quite a few people, who have neither the inherent competence nor the aptitude for teaching come into this profession. This happens largely because no screening worth the name is attempted while admitting students to teacher training schools and colleges. The teacher training too is not planned and organized to develop the spirit of inquiry, initiative, scientific temper, manual dexterity, conceptual clarity and linguistic skills for effective speaking and writing which teachers are expected to impart to their students. Adequate attention is also not given to develop communication skills which are crucial to the function of the teachers. The training programme also does not provide for developing receptivity to induction of modern educational aids nor does it impart skills to operate even audio-visual equipment. While it is increasingly emphasised that education should become an instrument of national integration, cultural cohesion and development of humanitarian values, the trainees in teacher training institutions are not exposed to these ideas. No wonder, then, that they should fail to discharge this function. (Ministry of Education 1985, pp.55 -56)

Has the situation improved? If the situation has not been improved should there be a teacher licensing system, to be renewed at intervals to persuade the teachers to utilise self-directed learning strategies in making them fit to changes in school curricula and also innovations in ever changing teaching and learning strategies?

A number of developed countries have teacher licensing system. Seventeen years ago, in the United States, (National Research Council, US 2001, p. 5) stated that "Licensure systems should be designed to rely on a comprehensive but parsimonious set of high-quality indicators." Shuls and Trivitt. (2013, p. 1) analysing situation of licensing procedure and alternative routes of teacher training in United States stated that "there is little difference in terms of quality between traditionally and alternatively certified teachers. However, licensure exams do have some predictive power." Analysing findings of PISA 2015, OECD (2018, p. 47) pointed out that "Certification requirements can add another layer of selection. While teacher certification, credentials and licenses offer no guarantee of excellence in teaching, they may help ensure that only the most motivated candidates progress in their career. " The study reported that Australia has a system of teacher registration renewal every five years, till the teachers achieve "Proficient" level, in the Australian Professional Standards for Teachers. In South Australia, once an individual is in his/ her final semester of study in an Australian teacher education program, or his/ her overseas qualifications have been assessed as meeting the Board's registration requirements, s/he can apply for teacher registration(Teachers Registration Board of South Australia 2018 September 8). In Singapore, the country which had topped in the latest PISA, does not have any system of licensing. "However, teaching graduates in Singapore must successfully complete a probation period in which their competence for the job is evaluated" (OECD 2018, p. 48). Singapore ensures better

teacher candidates by offering teacher trainees competitive monthly stipends for which the top third of the secondary school graduating class students opt for teacher training.

In United States, Minnesota Professional Educator Licensing and Standard Board (2017) states that "applicants of a first professional teaching license must provide evidence of completing the skills examinations in reading, writing, and mathematics using the examinations adopted by the Professional Educator Licensing and Standards Board." In Germany, there is provision for initial teaching certificate, which needs to be renewed at intervals. Provision existing in Alabama State for initial teaching certificate as found on 2018 September 9 is given below:

> There are 3 classes of Professional Educator Certification in Alabama - Class B, Class A and Class AA. Each class is connected with differing pay structures (exact pay will depend on the county where you wish to teach - contact your desired county to learn the exact compensation). The following are educational requirements for each certification Class.
>
> Prior to qualifying for Alabama teaching certification, you will need to pass the Alabama Prospective Teacher Testing Program or APTTP. The APTTP is a statewide testing program to ensure new teachers are proficient in 3 basic skill areas - Mathematics, Reading, and Writing - as well as any prescribed subject or intructional support areas (e.g. Chemistry, Biology, Calculus, etc.). Subject area testing will be provided through the Praxis II subject assessment examinations. Official scores of all examinations need to be sent directly from examining organization to the Alabama Department of Education to be considered official.(Alabama Department of Education 2018a)

In our own country, there was a system of probationary period in teaching jobs, and a teacher was confirmed, only when the head of the institution

gave a satisfactory certificate. It may be necessary to have appropriate changes in teacher recruitment rules making a Provisional License to teach that may be valid for one year. A person with provisional license may take up the work of a regular teacher on a lower rate of remuneration than applicable to a fully licensed teacher. In order to be entitled to appear at the test meant for issue of regular license, the person with provisional license may need to undergo further training for a period of one year under the guidance of a carefully selected experienced teacher called mentor. A mentor may be a duly selected experienced teacher. Selection of teachers to act as mentors may be carried out by the Directorates of School Education of the concerned State /UT School Departments through their Inspectors/Supervisors on the basis of analysis of records of performance. A mentor at the class XI-XII stage may be for a particular subject. The mentor may be paid remuneration for the work at a rate to be fixed by the concerned State Government.

The Centre on International Education Benchmarking (2016, p. 7) points out that in Singapore, all teacher trainees are selected on the basis of performance on a written test and interview to test attitude, aptitude and personality and are closely monitored and if necessary are asked to withdraw from teacher training. On joining a school, beginning teachers pass through an Induction process spread over two years, in which they are given 80% of workload and work under supervision of mentor teachers. May be our nation study the system of Singapore and introduce such an induction programme for our beginning teachers and bear the cost of training of mentor teachers and incentives / remuneration to mentor teachers. After successful completion of induction programme, the candidate may apply for Regular License as a Teacher.

Present teacher selection test may be treated as test for provisional license for teaching. It may be impproved by including certified video recording of Classroom Teaching Skill Test and interview based on the video recorded teaching..

The system of renewal of registration is in vogue in a large number of developed nations. In a study conducted in United States, Buddin and Zamarro (2008, p. 31) reported that "More experienced or better educated or more skilled teachers (as measured by licensure exams) may inherently be better able to teach, but they may not persistently practice those abilities in the classroom."(Buddin and Zamarro (2008, p.31). Teachers Registration Board of South Australia (2018 September 8 b) states that "Your teacher registration is active until 31 January of the third year following your last registration or renewal. Prior to your registration expiry date you can apply to renew it for a further 3 years. You can check your expiry date on the public register." Provision existing in Alabama for teaching certificate renewal as found on 2018 September 9 is given below:

> "To renew a Professional Educator Certificate (valid for 5 years) that expires June 30th, all requirements must be completed by September 1st of the same calendar year. And your application must be received by the Teacher Education and Certification Office of the Alabama Department of Education no later than December 31st of the same calendar year."

As per this document renewal is granted, after three years of service. (Alabama Department of Education 2018b)

In India, the license may be initially issued for a period of three years. During this period, the teacher may have to produce evidence of 1.Successful participation in in-service programmes for at least a period of three months, on own initiative, 2. Record of at least 12 action researches, 3. Presentation of at least three papers in conferences / seminars for school teachers and publication of at least two articles in state level monthly journal, on school education, if any brought out by state government agency / association of school teachers.

If teacher licensing system-provisional and regular is introduced, it may be necessary to have two levels of teacher eligibility tests. Of course, the regular licenses may need to take into consideration other aspects of teacher performance such as portfolios, video recording of lessons, student assignments, etc. Introductionn of licensing system-for speciuific duration may motivate teachers to update their knowledge and skill through self-directed learning strategies including use of online resources that may take care of the damage caused due to loss of periodic teacher in-sdervice programmes carriued out through extension services department of teacher training institutions.

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Journal of All India Association for Educational Resaerch
Vol.29, No.2, pp.8-33 December 2017

AFRICENTRIC EPISTEMOLOGIES AND ONTOLOGIES DIRECTING RESEARCH ON AFRICAN ISSUES FOR AUTHENTIC OUTCOMES

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Lambert Wirdze

The focus of research in Africa has often been limited only to areas where funding exists, accordingly failing to address the all-important issue of Africentricism (Sawyer, 2004). Such research outcomes impacting policy respond to narrowly defined objectives of the funding agencies thus missing out in documenting the held ideals and values of the people and culture. Studies of this nature use research methods built on Eurocentric theories, not well equipped to handle typical contextual issues relevant in understanding African epistemologies as valid frame of reference for Africa that address African reality. Peoples' philosophy and psychology depict their mind theory in the way they think, feel and function, given the relational nature of the culture. This paper therefore advocates for a change in the conduct of research relevant to Africentric epistemologies and ontologies. The responsiveness of research is of value to what constitute a people's behaviours; how these behavours patterns are acquired, represented and the purpose these serve in human existence. Africentric epistemological experiences are deeply rooted in the logical processes of induction whereby knowledge is socially constructed from specific observations and interdependent behaviours to broader generalizations and theories. This paper advocates the adoption of an inductive approach to understand the reality of the context before subjection to deductive methodologies.

INTRODUCTION

In the 21st century, it of importance to develop in people research skills that are essential for production of useful knowledge that can lead to development. Critical creation and dissemination of knowledge is vital

for economic competiveness and community development. Despite the fact that Africa is home to 12% of the global population, it is claimed that the continent accounts only for just 1% of scientific research contribution (Ameenah, 2015). There is therefore the need not only to improve on the volume of scientific research in Africa, but equality to highlight the fact that research in Africa should be underpinned by Africentric epistemologies that form the bases of knowledge creation that lies at the very core of all political, economic, environmental, cultural and social development that is contextual and relevant to African societies. The relationship between a people's epistemology, ontology and research is crucial because "for research to play a significant part in development, it must be relevant to the problems unique to the society. In addition, the researchers must be provided with tools to effectively design their models, conduct the research and successfully disseminate their results" (Nsamenang and Tchombe, 2011, p. 415). According to Aluma (2004), African indigenous knowledge base has always been viewed as problematic. It is misunderstood, misrepresented and sometimes overlooked (Aluma, 2004). Oburu (2011) goes on to explain that indigenous African research inquiry approaches, are often devalued as lacking scientific validation. Thus most of what constitutes scientific research in Africa is underpinned by Eurocentric epistemologies, methodologies and theories that are alien to Africa and for most of the time do not address the real contextual and developmental needs of the continent. Hence, the problem of the slow pace of developmental outcomes in most African countries is a pointer to people's lack of access to quality research knowledge that is relevant and addresses their needs. Quality research demands critical reflection on the epistemological and ontological foundations of the creation, dissemination, transmission, validation, and the use of knowledge.

In order to address research gaps in Africa, there is need to seek valid answers to key epistemological and ontological questions like,

- What is Africentric content and source of knowledge?
- How is Knowledge produced within African cultures?
- What does knowledge tell about the African world view?
- What are the best Africentric methods of inquiry that can lead to effective acquisition, validation and dissemination of knowledge?

Achieving sustainable development in Africa, entails that research should be guided by the philosophical principles (induction, social constructivism) of African epistemology and ontology. Research can be defined as the search for knowledge or any systematic effort designed to discover, establish or ascertain facts. Scientific research relies on the application of the scientific method to address curiosity or uncertainty (Amin, 2005). The scientific method is a way to ask and answer scientific questions by making observations and doing experiments or designing and carrying out studies about the world (Tchombe, 2011). According to Narh (2013), the assumptions that underlie the creation and dissemination of knowledge and research on Africa, should be informed by Africans' own conception of epistemology (the ways by which knowledge is acquired and used) and ontology (the nature of reality and knowledge) (Wirdze, Sahfeh, Likie & Bongwong, 2011).

THE STATE OF RESEARCH IN AFRICA: ISSUES AND CHALLENGES

With the claim that Africa is contributing just 1% of world's total research outcomes (Ameenah, 2015), it is important to highlight the state of research in Africa and the challenges faced by African researchers especially in generating knowledge that is relevant and contextual for Africa. Progress for Research in Africa, therefore remains a challenging phenomenon that requires attention for eventual growth and development. We shall examine these challenges.

The Gap between Research, Policy and Practice

It should be noted that global agendas for development (EFA, MDGs, SDGs) have not explicitly posited the relevance of research towards development and the path which Africa must take towards acquisition, dissemination and use of its continental body of knowledge. Africa's Agenda 2063 aspires that by 2063, millions of Africans will have been trained, educated and skilled with special emphasis on science, technology, research and innovation, as well as vocational training in every sector. The Continental Education Strategy for Africa (CESA, 2016-2025) equally states in one of its principles that "quality and relevant education, training and research are core for scientific and technological innovation, creativity and entrepreneurship".(p.7). Nonetheless, little is spelled out in the agenda and strategy as to how research should be galvanized for the growth of Africa's knowledge content. While acknowledging that tertiary education supports economic development directly by generating new knowledge, building capacity to access the global storehouse of knowledge, and adapting knowledge for local use are critical concern, The 2063 agenda points out a major limitation of African tertiary education by stating that tertiary education is the backbone of research and development, an area where Africa lags behind significantly. Although South Africa and Nigeria are able to act as global players in technology development, including aero-spatial research, many African countries have less advanced research and development capacities, which are also male, dominated. Research and development as a percentage of GDP ranges from 0.3 per cent to 1 per cent in most African countries, as compared to European countries (Finland 3.5 per cent, Sweden 3.9 per cent), USA (2.7 per cent), as well as Japan, Singapore and Korea (2-3 per cent). However, in 2003, African Ministers of Science and Technology were committed to raise research and development (R&D) to at least 1 per cent in five years, demonstrating that African policy makers are fully cognisant of the challenge.

There is a dichotomy between the content of the policies and the realities that are found in the field. This is due to inadequate contextually relevant research to inform policy formation and implementation. There tends to be a lack of communication between researchers and policy makers. Policy makers are not always informed about ongoing research and researchers often lack knowledge of the most pressing policy questions that they would need to make their research more relevant. There is the absence of a multidisciplinary approach with emphasis on the social science sub-disciplines of education and inadequate strategies of implementation. The nature of the policy framework for higher education and other research institutes should provide orientations for issues of interdisciplinary research, participatory research, action research, and collaborative research which are the Africentric content of knowledge acquisition and dissemination (Nsamenang 2005; Rogoff, 2003).

Institution Based Research

One of the challenges faced by research in Africa is the limited amount of research that is mostly done by individuals and small groups focused on university studies and professional advancements. The typical projects are still discipline oriented, university based, and funded by the university or under its auspices. This type of research is undertaken essentially as part of the academic career of the researcher who decides what to study and whether and how to disseminate the results (Sawyerr, 2004). While this seems to increase to body of university research, there is a downside to this trend toward increasing institutionalisation of research.

The acquisition, production and dissemination of knowledge end within institutional boundaries. The results and findings obtained from this kind of research end up in university libraries. Little is published for external consumption and recommendations hardly reach the various stake holders that were of significance to the research process. The indifferent quality of research support staff reflecting the low priority attached to training

and specialization in research management and administration create negative conditions for conducting open research and building holistic research competencies (Sawyerr, 2004). Thus, most formal institutions in Africa follow western curricula and methodologies; hence, research conducted may not reflect African epistemologies and ontologies for relevant development (Callaghan, 1998; Ogbu, 1994).

Funding Research

Another challenge is the availability and adequacy of the means for undertaking research. The underfunding of research and research institutions in Africa is common. Most funding is dominated by Eurocentric donors who dictate alien hypothesis, methodologies and possible findings that are illusive of the contextual realities in Africa. In most cases the communities are not aware of these researches in their communities. So, African researchers and governments to an extent have allowed the ownership of generating Africentric knowledge and values in the hands international donors, who dictate research outcomes to their favour. Thus authenticity and reality may not be assured. As the typical African economy has become more outward looking, its leading edges have locked more firmly into external knowledge sources while local producers of knowledge rely on foreign-based parent companies for research. Under such conditions, local knowledge generation becomes increasingly uneconomic, and market forces direct resources away from support for the local production of modern knowledge (Sawyerr, 2004).

The problem of funding is further viewed in the environmental conditions for successful research focused on the institutional provision of infrastructure within which research is conducted. The key elements here are a minimum of research infrastructure, such as laboratories, equipment, libraries, and an effective system of information storage, retrieval, and utilization, appropriate management systems that recognize and reward high-calibre research (Sawyerr, 2004).

The following figure illustrates the challenges and issues of current state of research in Africa.

Figure 1: Challenges and Issues of Research in Africa

ACHIEVEMENTS AND CONTRIBUTIONS OF AFRICAN RESEARCH AND DEVELOPMENT

Despite the challenges and issues of research in Africa, it is worthy to note that Africa has largely contributed to world research, though this contributions are not acknowledged due to misconception is misunderstands which can be attributed to lack of knowledge or appropriate information about persons, events or situation (Tchombe, 2016). Africa's research output is continuously being compromised in favour of writings that do not reinforce Africa's values, actions, customs,

culture and identity; writings about Africa which are untrue; writing about Africa, which are negative (Smith, 2003). The goal of this section is to explain Africa's greatness and it contributions to education, science, and spirituality, which the western world sought to eradicate. The table below illustrates African achievements in research, science, technology, engineering, mathematics and humanities.

Table 1
African Research and Development

S/N	Research Field	Research Output
1	Birthplace of Humanity and Cradle of Civilisation	Discovery of skeletal remains of modern man (6th stage) and stone tools specific at Herto Bouri in Ethiopia 55000 years ago; Egyptian civilisation, 3000bc.
2	African Scripts	African scripts found in about 800 texts, discovered in French museums.
3	Metallurgy/ Mining/ Tools	Production carbon steel; technological supplication; greater fuel economy; advances in metallurgy and tool making. In Tanzania, Uganda, Rwanda
4	Astronomy	Discoveries of movement around the sun, the constellations, the cycles of the moon, detailed astronomical observations by Egyptians and Dogon people of Mali.
5	Medicine	The use of plants to heal pain, diarrhoea and malaria etc. Performance of medical procedures like vaccination, autopsy, brain surgery, skin grafting, filling of dental cavities and Caesarean section. The African multigenius Imphotep is considered as the first physician in history.

6	Mathematics	Scripted textbooks that included division, multiplication, geometry, trigonometry and Algebra developed in Egypt, Nigeria and Zaire.
7	Architecture/ Engineering	Egypt and its pyramids; Immense construction site and cities in Great Zimbabwe, Mozambique, Timbuktu; Ancient Africans sailed to South America and Asia, hundreds of years before Europeans.
8	Writing	The Egyptian hieroglyphic system. This earliest form of writing was a syllabic system that included hundreds of phonetic signs, shortened and used as an alphabet by the Egyptians 5000 years ago.
9	Economic and Political development	Civilisations of the Nile, Mali, and Great Zimbabwe etc. Timbuktu was a major economic and university centre for about three centuries, from the 13th up to the middle of the 16th centuries. The gold from the great empires of West Africa, such as Ghana, Mali and Songhai, provided the means for Europe's economy to take off in the 13th and 14th centuries. Other kingdoms and empires were in Ethiopia in the east which was in many ways exceptional rather than typical.

Source: Adapted from Tchombe (2016)

The continuous decontextualisation of research in Africa, imposed by western methods and outcomes call for new ways of conducting research in Africa that is sensitive to Africentric epistemologies and ontologies, with the adoption of an inductive approach to understand the reality of the context before subjection to deductive methodologies. Africa has ecological, humanistic and spiritual capacities embedded in traditional education that can form the bases of research in Africa (Tchombe, 2016).

THE IMPORTANCE OF AFRICAN TRADITIONAL EDUCATION IN DEVELOPING RESEARCH CAPACITY

Despite the view held by western philosophers (Georg Wilhelm Friedrich Hegel, David Hume, Levy Bruhl) that African traditional education is pre-logical and not scientific, Ogunniyi (1988), ascertained that scientific and traditional ways of viewing nature are the two systems of thought that are not completely incompatible. African traditional education refers to a teaching and learning process by which indigenous knowledge transmitted respond to different physical, agricultural, ecological, political and sociocultural challenges (Merriam, 2007). It is valuable because it is holistic, "addresses the intellectual, physical and attitudinal aspects of life. It encourages the development of critical thinking, imagination, creativity and action skills. African education foresaw the era of globalisations and its needs for development of problem solving skills" (Tchombe, 2016, p.19). Rogoff (2003) argues that human development must be understood as a cultural process. Individuals develop as participants in their cultural communities, engaging with others in shared endeavours and building on cultural practices of prior generations. Onwauchi (1972), argues that if the educational process is to be functionally relevant for the African peoples, it must be structured so as to maintain a dynamic pattern of continuity with the family and the cultural life patterns of the people. For research to be effective in Africa, there is need for it to reflect the ecological, humanistic and spiritual dimensions of African traditional education as illustrated in the Figure 2.

The Relevance of African Epistemology and Ontology in Research

The bases of generating knowledge in research lies in a firm grip of the epistemologies and ontologies that shape a particular group of people. Epistemology is derived from the Greek *epistēmē* ("knowledge") and *logos* ("reason"), and accordingly the field is sometimes referred to as the theory of knowledge. Ontology comes from two Greek words: *on*, which means "being" and *logia*, which means "study". So ontology is the study of being alive and existing (Wirdze, et al. 2011).

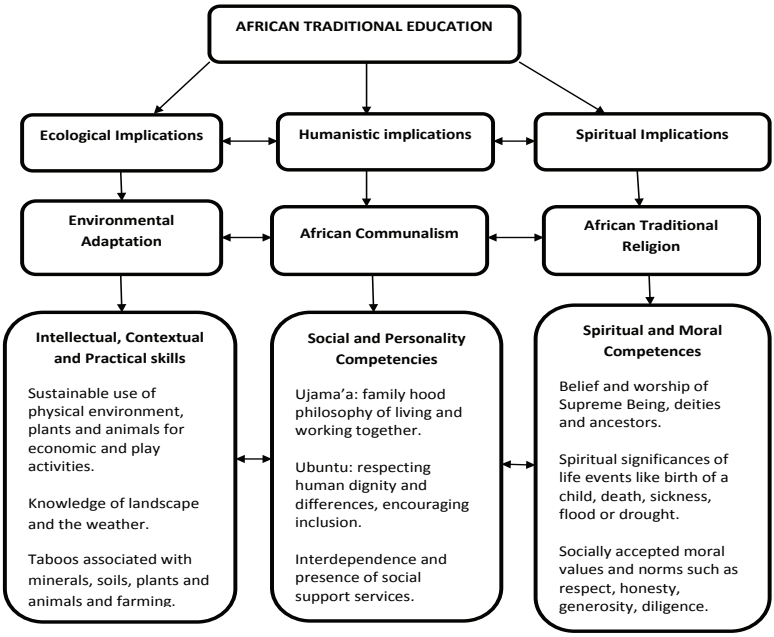

Figure 2: Traditional Education in Developing Holistic Research Capacity:

Source: Adapted from Tchombe (2016)

African Epistemology

African epistemology is the African theory of knowledge, which includes Africentric methods of acquisition, dissemination and use of knowledge (Mutombo, 2007). This entails that Africans are conscious of nature of knowledge; the means used to gain knowledge; the criteria for the assessment of the validity of knowledge; the purpose of the pursuit of knowledge; and the role that knowledge plays in human existence and development. (Mutombo, 2007). African epistemology is therefore the ways by which Africans conceptualise, interpret and apprehend

reality within the context of African cultural or collective experiences (Anyanwu, 1983). This is based on the understanding that such concepts as knowledge, truth, rationality etc. can be interpreted using African categories as provided by the African cultural experiences without a recourse to Eurocentric conceptual framework. It follows that African traditions, which entail African religions, root culture, oral literature, traditional arts, fables, proverbs, idioms, rituals, music, dance, folklores and myths, are the content of African epistemology (Amaechi, 2014). Tchombe, Nsamenang, Lah Lo-oh(2013) also characterised African epistemology from different perspectives such as in the establishment of interpersonal relationships, harmony with one another, cooperation, communalism and spirituality. They argued that from a research perspective, the community is an important source for discovering processes related to the production of African knowledge and its systems. Accordingly, the crucial epistemological problem is the doubt whether Africans who supply cross-cultural data and are privileged to read the published reports of that research would recognize that the literature is about them! African epistemology as a science in its own right must be well reflected in research arenas.

African Ontology

The concept of "being" in is attached to the principle of the "Vital Force", a spiritual power that brings together a harmonious relationship between the physical, human and spiritual dimensions of existence in a hierarchical fashion. (Wirdze et al, 2011). The content or subject matter of Africentric ontology emanates from the physical, human/social and spiritual situations of indigenous African societies. We must however note that these three indigenous contents do not exist in isolation. Within the context of African cultures, they are psychologically and philosophically connected in such a way that one cannot construe of one without the other.

The physical environment influenced the content of indigenous ontology in that the natural environment is meant to assist humans to adjust and adapt to the environment in order to exploit and derive benefit from it in a harmonious relationship (Castle, 1966). The human/social environment is embedded in a communal lifestyle whereby living together, working together, feeling for one another and collective judgments are key elements of the social order. Parents and other adults in the community ceaselessly socialise their children to etiquettes that upheld reciprocal ties. Respect for elders and social hierarchy, sustenance of good friendships, conflict management, caution towards strangers, appreciation of social obligations and responsibilities and above all, to subordinate their individual interests to those of the wider community (Tiberondwa, 1978). Spiritually, Africans are notoriously religious, with beliefs in the Supernatural God, deities and ancestors, having strong influence on physical and human environments. African Traditional Religious (ATR) plays a key role in the life of children and adults alike: it provides a rallying point for the community and backed up socially-accepted values and norms such as honesty, generosity, diligence and hospitality (Ocitti, 1971).

As already highlighted above, the human world, the natural world and the spiritual world are linked. The natural world provides the habitat for the spirits and sends messages from the spiritual world to the human world. The spiritual world provides guidance, punishment and blessing to the human world. People therefore have to relate to both the natural and the spiritual world. (Millar, 1999). From the discussions above Eurocentric approach to research with its supporting explanatory theories would find it difficult to capture these realities depicting a people and their basic life's philosophy and psychology.

The figure below illustrates the relationship between the physical, human and spiritual spheres of African ontology.

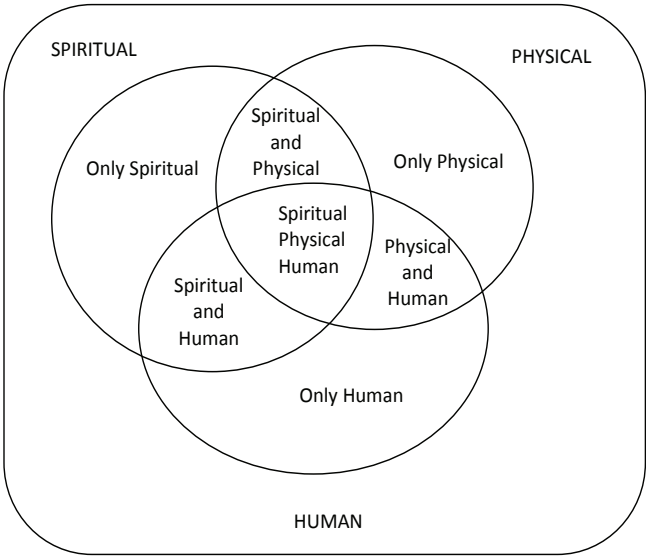

Figure 3: The three circles depicting African Ontology:

Source (Wirdze, et al. 2011).

Africentric Epistemology/Ontology as the Bases for Inductive Research Paradigm

Africentric epistemological and ontological experiences: Indigenous developmental psychology can promote understanding of social cognition—how a given people generate, acquire and use knowledge. In logic, we often refer to the two broad methods of reasoning as the ***deductive*** and ***inductive*** approaches (Wirdze, et al. 2011).

Deductive reasoning works from the more general to the more specific. Sometimes this is informally called a "top-down" approach. We might begin with thinking up a theory about our topic of interest. We then narrow that down into more specific hypotheses that we can test. We

narrow down even further when we collect observations to address the hypotheses. This ultimately leads us to be able to test the hypotheses with specific data, that leads to a confirmation (or not) of our original theories.

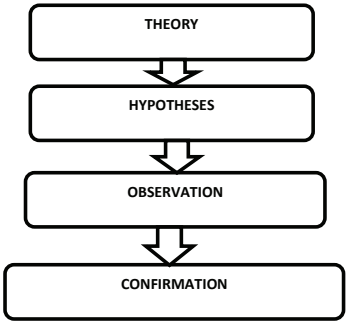

Figure 4: Deductive Research Process

Inductive reasoning works the other way, moving from specific observations to broader generalizations and theories. Informally, we sometimes call this a "bottom up" approach. In inductive reasoning, we begin with specific observations and measures, begin to detect patterns and regularities, formulate some tentative questions that we can explore, and finally end up developing some general conclusions or theories

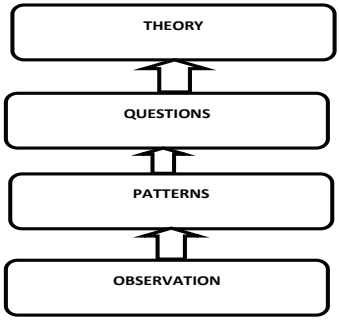

Figure 5: Inductive Research Process

These two methods of reasoning have very different "feel" to them when conducting research. Inductive reasoning, by its very nature, is more open-ended and exploratory, especially at the beginning. Deductive reasoning is narrower in nature and is concerned with testing or confirming hypotheses. It is important to understand the epistemological and ontological underpinnings of different cultures as the bases for adopting particular research approaches. This section examines aspects of African ontology and epistemology and how they can influence inductive research inquiry.

Harmonious Environmental Conception

Accordingly, in the African ontology, humankind is part of nature, as opposed to the Western conception (exemplified by Christian religion, but also by Islam) in which humankind is above nature and is thus allowed to conquer and control it (Dasen, 2011). This leads to two types of reasoning, global and symbolic on the one hand, based on inductive experience and geared to explaining the final goal of events, and analytical and experimental on the other hand, geared towards deductive explanation of causal effects (Dasen, 2011).

African epistemologies (unlike Eurocentric epistemologies) are therefore deeply rooted in the logical processes of induction whereby knowledge is socially constructed from specific observations and interdependent behaviours to broader generalizations and theories. This is so because, within African cultures, the harmonious relationship between the different spheres of existence as seen above blurs the distinction between the subject and object of knowledge (Tape, 1994). The African sees himself or herself as part of nature, which guides the methodology by which the study of nature is supposed to be approached in African. This line of thought permits the integration of diverse ethnocultural realities and disparate theoretical threads into a common conceptual system. The embedded knowledge, skills, and values are massed together as integral to social interaction, cultural life, economic activities, and daily routines (Nsamenang, in 2005).

Oral Mode of Communication

Under African oral communication patterns, the members tend to be related to each other in relatively long lasting relationships (Hall, 1976). The communication patterns of these cultures are conceptually associated with the cognitive abilities of concrete experience, leaving from observed particular realities to general theories (Inductive approach). These cultures require its members to become sensitive to immediate environments through feelings. For their effective communication, its members need to be situated in a specific surrounding circumstance, which results in the production of tacit knowledge that serves to distinguish covert cues. This kind of knowledge relies on the concrete experience abilities. In addition, interpersonal relationships are crucial in cognitive styles (Tape, 1976).

On the other hand, in Eurocentric written modes of communication, most information is conveyed in explicit and written codes; thereby, explicit communicative styles in logical forms are valued to a high degree. Interpersonal relationships in these culture last for a relatively shorter period. Communication patterns of these cultures are conceptually associated with the deductive cognitive abilities of abstract conceptualization, to the extent that abstract and symbolic presentation in logical forms performs as central methods of communicating with others.

Collective Social Pattern

In relation to collective (interdependent) and independent cultures Markus and Kitayama (1991) examined different people across cultures in Africa and proposed interdependent-self and independent-self, each of whose attributes differs among cultures. Interdependent-self is viewed as connected to the surrounding social contexts where the self and others are concretely situated. Experience of interdependence with others makes people see themselves not as detached from the social context but as part of an encompassing social context with its concomitant personal relations. Hence, research on groups of people require naturalistic and

participant observations that follow and inductive process. People here are required to watch and listen to others with great carefulness and to reflect upon their observations in their minds. They tend to spend time for reflection with subtle observations before taking actions and expressing themselves to others.

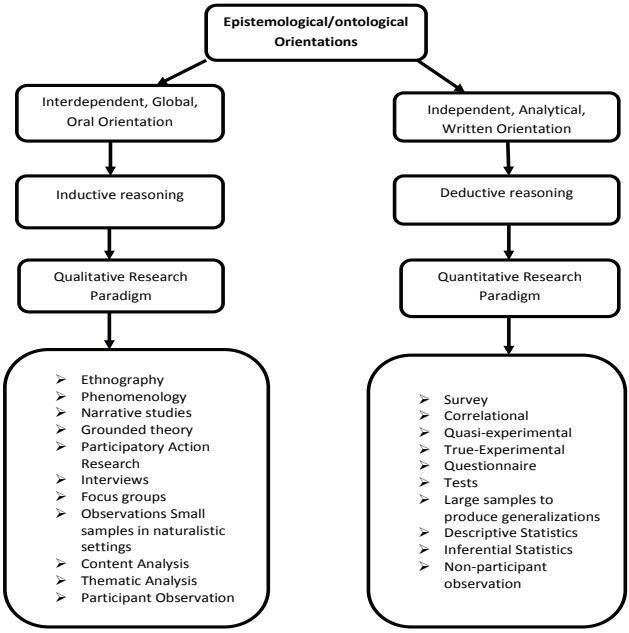

Figure 6: Epistemological/ontological orientations depicting different modes of reasoning and research paradigms.

In contrast, independent-self, the American and western European notion of self, is seen as an entity that contains important characteristic attributes and as that which is separate from context. There is a belief that people are inherently detached and distinct in American and many western European cultures where the cultural norm is internal control of reinforcement in order to become independent from others and

to express one's uniqueness. Although people with independent-self must be responsive to surrounding social circumstances, their social responsiveness arises relative to their need to determine the best way to display the deductive and inner attributes of the self (Markus and Kitayama, 1991).

The above epistemological and ontological orientations and how they apply to research are illustrated in the figure below.

The Figure 6 illustrates the two arms of epistemological/ontological orientations. On the one hand, we have the interdependent, global and oral orientation (common to African cultures). Induction is mostly used as a form of reasoning, thereby giving rise to more of qualitative research paradigm, exemplified by ethnography, phenomenology, grounded theory, interviews, content analysis and participant observation. On the other hand, we have the independent, analytical and written orientation (common to Europe and American cultures). Deduction is mostly use as a form of reasoning, hence, quantitative research paradigm is outstanding, with typical examples like survey, quasi-experimental, true-experimental, questionnaire, descriptive and inferential statistics and non-participant observation.

From Inductive (Qualitative) to Deductive (Quantitative) Methods: Innovative Research Approach for Authentic Outcomes

Qualitative approach to research is closely linked to the process of induction and is characterized by its aims, which relate to understanding some aspect of social life like people's experiences, perceptions, attitudes, emotions, beliefs. In such cases its methods will generate words, rather than numbers, as data for analysis. In situations (like in Africa) where little is known, it is often better to start with qualitative methods (interviews, focus groups, observations, narratives, conversations, analyzing figures, picture, infrastructure, etc). It can help with generating hypotheses that can then be tested by quantitative methods.

The quantitative approach is underpinned by the process of deduction. Quantitative methods are used to examine the relationship between variables with the primary goal being to analyze and represent that relationship mathematically through statistical analysis. Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, tests and surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative research focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon.

While the primary aim of the qualitative approach is to generate a theory (induction) the primary focus of the quantitative approach is to confirm a theory (deduction). Nonetheless, social science researchers use mixed methods (both quantitative and qualitative) depending on the nature of the inquiry and the expected findings and results. This paper advocates the adoption of an inductive approach to understand the reality of the context before subjection to deductive methodologies

Principles of Inductive (Qualitative) Research

Bryman and Bell (2011) suggest four principles of qualitative research, which have an important link to the type of knowledge inductive research can produce. These are:

***Naturalism:** Seeks to understand social reality ('as it really is') and provides rich descriptions of people and interactions in natural settings. This is the most commonly used tradition.

***Ethnomethodology/Participant Observation:** Seeks to understand how social order is created through talk and interaction and a conversation analysis needs to be conducted.

***Emotionalism:** Seeks to understand the inner reality ('inside' experience) of people. This tradition has not been used in a significant

stream of research but yet, it can be included in innovative research methodologies.

^**Postmodernism:** Seeks to understand the different ways social reality can be constructed. The impact of culture for example can be included in innovative research methodologies.

Creativity and Innovation in Inductive (Qualitative) Research

Qualitative researchers often aim to produce original and useful knowledge from the subjective meaning of social action. Creativity therefore seems to play an important role in the knowledge management process. Torrance (cited in (Afolabi, Dionne & Lewis, 2009) observed that creativity is "a successful step into the unknown, getting away from the main track, breaking out of the mold, being open to experience and permitting one thing to lead to another, recombining ideas or seeing new relationships among ideas" (p.2). Innovation is the process of both generating and applying creative ideas in some specific (research). In other words, innovation involves the introduction of something new and valuable – an artefact or a method – into a functioning production, marketing, or management system according to Cropley (2008). Innovation in social research can be categorised in three levels of novelty according to Wiles, Crow and Pain (2011), namely:

*The lowest level of innovation relates to adoption where established methods are taken and applied; or methods are combined; or where established methods are taken into a new discipline or sphere of study.

*The mid-level of innovation relates to adaptations. The research method is adapted or changed to improve the method or to meet the needs of a specific research context.

*The highest level of novelty relates to inception where researchers claim to be using a new or novel method.

Vision for Research in Africa

The research vision is conceptualized here as constituting a programme and set of approaches that are situated within the decolonization politics of the indigenous peoples' movement. The agenda is focused strategically on the goal of self-determination of indigenous peoples. Self-determination in a research agenda becomes something more than a political goal to embrace goal of social justice which is expressed through and across a wide range of psychological, social, cultural and economic terrains (Smith, 2003). This is illustrated in the figure below.

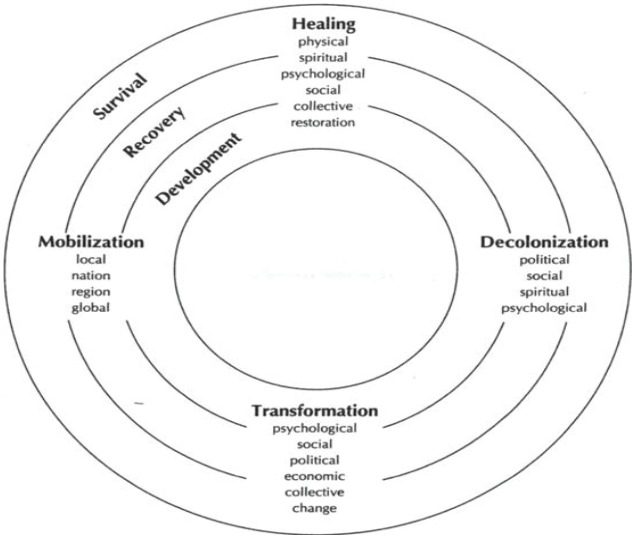

Figure 7: The indigenous Research Agenda:
Source, Smith (2003)

The four directions named here are decolonisation, healing, transformation and mobilisation. They are processes which connect, inform and clarify the tensions between the local, the regional and the global. They are processes which can be incorporated into practices and methodologies. Four major tides are represented in the chart as: survival, recovery,

development, self-determination. They are the conditions and states of being through which indigenous communities are moving (Smith, 2003).

CONCLUSION AND RECOMMENDATIONS

Whether conducted for specific purposes (action research) or as an academic pursuit by policy makers or academics, research has an impact on all areas, especially in the context of human and social development. However, there is a growing need to question the paradigms of knowledge and innovation that inform the research carried out in Africa. Harnessing local knowledge is important in prioritising the local community as the object of development (Teasdale and Rhea, 2000). With the increased recognition of the social role of higher education in development (Bok 1984), universities are called upon to conduct projects and programmes aimed at local communities (and the world) and provide services to local people. There is need to promote stronger integration of training and research and closer interaction with stakeholders in the development process. There is also an urgent need for African Universities to create a South and South and even North South network not only for collaborative research but also put in place a mechanism to enhance publications and the valorisation of the outcomes of research in Africa to inform the others and enrich their knowledge and understanding of African scholarship.

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Journal of All India Association for Educational Resaerch
Vol.29, No.2, pp.34-49, December 2017

EVALUATION OF EDUCATIONAL POLICIES IN INDIA FOR INCLUSIVE EDUCATION SYSTEM

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Special education[1] and Integrated education[2] concepts were prevalent in India for long. However, consequent to the ratification of UNCRPD, adopting the principle of inclusive education is mandatory for the education system and therefore it should be included in all the policy documents. This paper attempts to analyse the percolation of the concept of 'Inclusion' in the policy and programme documents in India after ratification of UNCRPD. The policies taken for study are the RTE 2009, RMSA 2013, RPWD Act 2016, and SSA. These documents are analyzed in the light of concepts of inclusion. The concepts of inclusion are studied at two main places i.e. in the definition of 'inclusion' and 'disability' given in various policy documents. Further the concept of inclusion and its amalgamation is probed with other principles of education such as 'equity' and 'quality'as these are two wheels of inclusion. It is found that policies and programmes have not operationalised the concept of inclusion in their activities. Instead the concept of 'Integration' is being operationalised in most of the policies and programmes. This absence of the concept of inclusion in the policy and programme documents is first hurdle for its implementation. The paper highlights the major gap in the percolation of the vision of 'inclusion' from UNCRPD i.e mother policy document to further sub policy documents. The gaps need to be addressed by policy makers.

INTRODUCTION

All parents want their children to lead independent lives on their own. To lead an independent life individual need to interact with the environment that demands certain capabilities or skill sets to sustain the interaction. Besides the skill set of the individual, there are also some infrastructural and attitudinal factors that either facilitate or hinder the interaction of the

individual with the environment. For example, if a person has to ride a bus to reach market, s/he requires skill set of reading the bus number. A sighted person would have acquired necessary reading ability through education that helps him/her to ride the bus to reach market. On the other hand, a person with visual impairment (VI) would require alternate support such as provision for information in Braille at the entrance and tactile path to the bus station to ride the bus to reach market. In this way, skill of reading as well as facilitation of the infrastructure leads all citizens with or without impairment to equally utilize common public services.

India is well known for its vision of inclusive society and therefore, the values of equality, justice and brotherhood have been propounded in the Constitution of India, the first policy document of the country. All sub policies, be at the national or state level emanated from the values enshrined in the Constitution. Ever since independence, all policy documents have included equality as the goal to be achieved. However, for many years equality has been understood as equity because constitution does not mention equity per se, it only talks about equality before law (article 14). Equality means treating everyone equally while equity means treating people according to their need. The reservation policies in the country are geared towards bringing marginalized at par with non marginalized and not about lifting them as per their need or capability. All educational policies have been in tune with the goal of equality in India. For example, in the Mid Day Meal programme of the county, the funds are sanctioned for a definite quantity of grain say 20 gram per child. It is based on equality principle. Similarly, special schools and integrated schemes of CwD are based on equality principle. Contrary to that, UNCRPD propagates the principle of equity for inclusive education and not equality. Lately, the concept of equality is replaced by equity in text but it may not be in practice.

The percolation of a value enshrined in the policy document is to be supported by sub policy documents. For example, if vision of a policy is to provide equal opportunity for education to all, then the vision needs to get translated into such policies as right to admission and many other related educational activities in the school to facilitate such ethos. If these sub policy documents are not available or propagate different value other than main policy, then the value does not get transmitted to the society. This paper attempts to analyze sub educational policy documents in India to find out how far they are supportive of inclusion of 'Children with Disability' (CwD) in schools based on the UNCRPD principle of inclusion if not what could be the reason for the gaps and how to fill that.

METHOD

The objective of this paper is to analyze the content of policy documents related to education–UNCRPD 2007, RTE Act 2010, RPWD 2016, and SSA and RMSA schemes with reference to the concept of 'inclusion'. A few codes have been developed for content analysis. These codes are disability, inclusion, equity and quality. The codes on 'disability and 'inclusion' are examined from the perspective of similarity in the concept with UNCRPD, whereas the code of 'equity' and 'quality' from the perspective of agent of inclusion.

CONTENT ANALYSIS OF POLICY DOCUMENTS

All the above mentioned policy documents can be categorized into three tiers of policy documents. The first tier is of UNCRPD 2007. It is an international treaty and is a mandatory legal framework for the country. The Supreme Court relies on international commitments in case national Acts are different and not in conformity. The second tier of policy documents is of national and legal policy documents i.e RTE 2010 (amendment) and RPwD Act 2016. Both the Acts have been notified after the international treaty; therefore it is presumed that they should be in consonance of the UNCRPD. The third tier of policy documents

are national schemes namely SSA and RMSA launched with the purpose of transmitting national vision to society. Though these schemes are launched prior to UNCRPD but have annual monitoring and targets. Therefore it is presumed that these should also be aligned and updated regularly and are in conformity of main policies. If these schemes are non responsive to the value of the main policy document say mother policy document i.e UNCRPD, the value will remain not transmitted to the society.

Disability: The first code is disability. The analysis, different meanings and definitions associated with the term disability in different policies and at any section of the policy has been collated and is presented in the table -1.

As evident from the Table-1, the concept of disability as given by UNCRPD in 2007 has not been incorporated in the policy documents of India. Even the latest policy document i.e. 'The Right of Persons with Disability Act 2016' has also not incorporated the complete definition of the disability. Another important change observed, is that the word 'evolving' has been replaced with the word 'long term'. This change has many repercussions with respect to nature of disability, onus and cause of disability. The word evolving denotes the nature of disability as dynamic. It may exist due to other factors and may not exist if those factors are not present. Therefore the concept of the origin of disability is very important. In the definition given by the UNCRPD, the origin is not the individual per se but the **interaction** of the individual with the environment both physical and attitudinal. This concept has far reaching impact while designing the policies and programmes. It is a key game changing concept as it brings many paradigms shifts in teaching and learning. It shifts focus from demand to supply, access to outcome, charity to right etc.

Table -1
Definition of disability as given in the different policy documents

UNCRPD 2007	RTE mendment 2010	RPWD Act 2016	SSA	RMSA (IEDSS)
Preamble (e) recognizes that Disability[3] is an evolving concept. Disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective Participation in society on an equal basis with others.	Accepted definition of PWD Act of 1995 as 'person with disability" i.e., a person suffering from not less than forty per cent of any disability as certified by a concerned authority;	Person with disability" is a person with long term physical, mental, intellectual or sensory impairment which hinder his full and effective participation in society equally with others.	SSA will ensure that every child with special needs, irrespective of the kind, category and degree of disability, is provided education in an appropriate environment. SSA adopts 'zero rejection' policy so that no child is behind the education system.	Accepted disabilities as defined under the Persons with Disabilities Act (1995) and the National Trust Act (1999). The type of disabilities range from blindness, low vision, leprosy cured, hearing impairment, locomotor disability, mental retardation, mental illness, autism and cerebral leprosy, speech impairment, learning disabilities etc.

For example, if a person has not been able to reach a destination due to environmental barriers such as staircase and his interaction with staircase due to being orthopedically impaired, is a cause of concern for government. Similarly, a person with visual impairment (VI) may not be able to go to school and learn due to attitude of the community, for instance Why to send a VI child to school when s(he)cannot see the blackboard and read books? Here attitude is the main cause of concern for policy planners besides making available right learning material. These attitudinal and environmental barriers need to change as they enhance disability more than the impairment itself. If an orthopedically impaired

person is provided with ramps and wheel chair s (he) can participate fully and equally in the society. Similarly, if a person with VI is provided with the books in Braille, s (he) can learn like any other sighted person.

There is difference in use of the terms like 'long term' and 'evolving' in the policy documents. The UNCRPD uses both the terms[4] whereas RPwD Act uses only 'long term'. The use of both the terms in the policy document and of only one term changes the concept of disability. As use of 'long term' denotes it as condition of the individual whereas the concept of 'evolving' denotes it as condition of the associated environment. The concept of 'long term' puts responsibility on impairment of the individual where as the concept of 'evolving' makes the environment and its interaction with impairment responsible. This is the genesis of social model where disability is not restricted to impairment of the individual alone. The analysis of SSA and RMSA shows that the definitions of disability are based on nature and degree of disability which is not in conjunction with UNCRPD.

Nature and degree of Disability:

Policy documents reveal the difference in the nature of disability too UNCRPD does not include any list of specified disabilities whereas the definitions given in the SSA and RMSA schemes have classified disability as per PWD 1995 and National Trust Act of 1999. Though PWD ACT has been replaced by RPwD Act but as seen in the table it has also listed disabilities. The concept of 'long term' condition of impairment is adopted, which is restrictive in its approach. The restriction resulted in listing of disabilities and percentage of impairment. As a result RMSA covers only eleven types of disabilities in its ambit, which has been increased to twenty one in the RPWD Act of 2016 with the scope to add more.

One may argue that SSA has taken view of 'zero rejection' irrespective of kind, category and degree of disability and does not mention the percentage of disability for admission. But the definition of disability is based on the meaning of long term condition of impairment of the individual of the Act and not as per UNCRPD.

Thus the definition of disability as long term condition without mentioning its evolving nature as stated in the policy documents such as RTE Act, RPwD Act, SSA and RMSA indicates that they are deficient in some manner and may restrict the participation of certain individuals. Thus next code is 'inclusive education' to be analyzed in the policy documents.

Inclusive Education

Inclusive education is a heuristic term. It means different things to different groups. For example it may mean gender to some and to others social and economic marginalized groups. Inclusive education in the context of children with disability means that educational provisions are not to be made available in segregated settings in the form of special schools or in the form of integrated sections in the regular schools. The education has to be made available in the inclusive settings only. It is a technical term which needs to be given operational definition in educational policies for better implementation.

The definition of inclusive education as given in the policy documents is reproduced in the Table-2.

UNCRPD has defined the term 'inclusive' by placing emphasis on 'quality', on 'equal' basis and 'communities in which they live'. It is evident from the table that these three terms are not used in the policy documents of India. However if we derive the inferences from the terms used in the documents , it is found that these terms are present. For example, in case of the RTE Act the emphasis is on the word 'completion. This can be interpreted as completing elementary education of same

quality and on equal basis as others. Further the term 'Quality' may be interpreted as same curriculum and 'on equal basis' as any other student. The RTE Act also uses the term 'in neighbourhood' which may mean as same as 'in the communities they live'.

Similarly RPWD Act is also found using different terms but one may infer the same meaning. For example, the words used is ' learn together' it may means same as in 'communities they live'; and the words ' system of teaching and learning suitably adapted' may also mean 'of same quality on equal basis'. In case of SSA, the same analysis does not hold true. Because the terms used such are 'home based, ''special', 'integrated education', 'open education' and 'part time classes' these neither means 'in the community they live' nor with peers. It may remotely mean same curriculum, though it is not explicitly mentioned. Contrary to SSA, the document of RMSA adopts the terms 'inclusive and 'enabling environment in its framework of education'. These two words may mean equal and of same quality of education to all. RMSA document thus can be interpreted as facilitating same type of education in the regular school in its textual interpretation. In brief, except SSA, other policy documents could be considered in line with UNCRPD in textual interpretation.

The text of the policy is transmitted by the implementation level activities. These activities should align with the vision. Therefore, the activities funded under SSA and RMSA are examined from the perspective of 'Equity' and 'Quality' as these two concepts are inherent to inclusion. The activities funded under SSA in the year 2014-15 are given in Table 3.

It is evident from the documentation and associated interpretations of the activities shown in the Table-3 that activity are supportive of integration and inclusion both. But if we interpret it in the context of practice, in reality, the education of CWD under SSA is based on appointment of resource persons and their training.

Table -2
Definition of Inclusive Education'

UNCRPD Act 2007	RTE Amendment 2010	RPWD Act 2016	SSA revised framework 2003	RMSA (IEDSS)2009
Persons with disabilities can access an inclusive, *quality* and free primary education and secondary education on an equal basis with others in the mmunities in which they live;	Every child of six to fourteen years shall have a right to free and compulsory education in a neighborhood school till *completion* of elementary education	Inclusive education" means a system of education wherein students with and without disability learn together and the system of teaching and learning is suitably adapted to meet the learning needs of different types of students with disabilities;	To providing integrated and inclusive education to all children with special needs in general schools. This includes education through open learning system and open schools, non formal and alternative schooling, distance education, special schools, home based education, itinerant teacher model, remedial teaching, part time classes, community based rehabilitations (CBR)	The aim of this scheme is to enable all students with disabilities to *pursue* four years of secondary education in an inclusive and enabling environment, after completing eight years of elementary schooling.

Table-3
Activities funded under SSA for education of CWD

S.N.	SSA PAB minutes of Delhi 2014-15	Activity leading to Inclusion/ integration	Activity leading to equity/ quality
1.	Assessment Camps for CWD	Inclusion	equity
2.	Aids and Appliances/ equipment/ assistive devices	Inclusion	quality
3.	Salary of Resource Persons	Integration	quality
4.	5 days training of General Teachers on Autism and Multiple Disabilities	Inclusion	quality
5.	International day for PwD	Inclusion	equity
6.	Inclusive exposure visit of peers and CWD	Integration	quality
7.	Corrective Surgery	Inclusion	equity
8.	Transport facility for 9 months	Inclusion	equity
9.	Parental Counseling	Inclusion	equity
10.	5 days training of RP on curriculum adaptation	Integration	quality
11.	5 days non- residential training of General Teachers on curriculum adaptation	Inclusion	quality

Resource persons teach CWD in resource rooms once a week. Appliances are provided to CWD specific to their disability to cope with the impairment. The teaching learning aids are very few and are given to the resource rooms. As a result integrated approach is followed. Secondly, Let us examine the activities leading to equity. As interpreted earlier equity means same curriculum and 'on equal basis' as any other student

in the system. The activities aimed at bringing CwD to school may be classified as leading to equity. These activities are parental counseling, assessment camp, corrective surgery, and transport facility. It is assumed that once a CwD is enrolled would be learning same curriculum as other. Learning achievement of same level as others is defined as quality. So to achieve quality, provision of aids and appliances, appointment of resource persons, training of resource persons and training of general teachers are funded under SSA.

However it is not inferred as inclusive due to the fact that under SSA resource persons are appointed for resource rooms at cluster level and not for school. CwD goes to resource room for learning. That makes the education being imparted to CWD not equal or of same quality. As a result CwD are found not learning as they are dropping out of the system. The analysis of the DISE data suggests that 95% CWD are dropping out of the system (Gupta 2016). Therefore, it can be concluded that the inclusion is not supported by SSA.

As discussed earlier, RMSA has included 'inclusion' in its document as guiding principle. However, it is yet to be studied whether these activities are leading to inclusion or not. The activities which are funded under RMSA are also analyzed from the perspective of 'inclusion' 'equity' and 'quality'. The analysis is shown in Table-4.

Table 4 shows that the inclusion is supported by the vision of the activities under RMSA. The provision of resource room under RMSA is indicated as supportive of inclusion unlike SSA because it is located in the school as well as at CRC/BRC/district. Further, the analyses of the terms of all the activities are also inferred as leading towards either equity or quality.

Table-4
Activities funded under RMSA for education of CWD

S.N.	Activities Under RMSA **	Activity leading to Inclusion/ integration	Activity leading to equity/quality
1	Resource room	Integration	quality
2	Equipments for resource room	Integration	quality
3	Special Toilets	Inclusion	equity
4	Removal of Architectural barrier (Ramps)	Inclusion	equity
5	Assessment camp	Inclusion	equity
6	Aids and appliance	Inclusion	quality
7	Large Print books	Inclusion	quality
8	Braille books	Inclusion	quality
9	Uniform	Inclusion	equity
10	Transport allowance	Inclusion	equity
11	Escort allowance	Inclusion	equity
12	Reader allowance	Inclusion	equity
13	Stipend for girls with disability	Inclusion	equity
14	Sports and cultural programme	Integration	equity
15	Special pay for General teachers trained in special education	Inclusion	quality
16	In service training for existing teachers	Inclusion	quality
17	Orientation of principals, administrators and parents	Inclusion	quality
18	Environment building programme	Inclusion	equity
19	Inclusive cell at state level for monitoring	Inclusion	quality
20	Inclusive cell at District level for monitoring	Inclusion	quality
21	Research Monitoring and Evaluation	Inclusion	quality

** Office order no. F.14-52/2013-IEDSS for Chhattisgarh 2013-14

To triangulate the inferences drawn, findings of implementation of IEDSS scheme as published by NCERT (n.d) are also examined with respect to equity, quality and thereby inclusion.

The state of Kerala has made highest number of aids and appliance available to CwDs. If the types of aids are probed further, it is found that all appliances are related to medical condition of the CwDs and none is related to learning. Medical aid can help in inclusion and could help in accessing educational opportunities but failure to provide educational aids is failure to provide quality education of equal quality. It is also reported that except Odisha and Madhya Pradesh, resource rooms are only constructed at block and cluster level. Accordingly this provision is also not leading to inclusion, equity and quality. The other findings are also indicative of not providing equal and quality education such as special teachers are recruited one for five CwDs, evaluations provisions are not made available to CwDs, removal of architectural barriers, provision of special toilets remains limited. In the study, three major hurdles are reported to make education inclusive. These are: buildings are not accessible, same teacher is not there to teach all, learning aids and accommodations during examination for CWD are not being practiced. The practice to teach CWD by special teachers in resource rooms is against the spirit of inclusion.

DISCUSSION

It is evident from the ensuing discussion that though India was having many schemes for education of CwD prior to ratification of UNCRPD, but the concepts related to disability and inclusion were not the same. In India, disability was considered as specified impairments of the individual therefore these were listed. And the same approach continued even in the RPwD Act of 2016 as it specified twenty one disabilities with the scope to add more. The concept of disability as a result of impairment of the individual resulting due to interaction with environment and

attitude of others; the concept of 'evolving' of UNCRPD, is not reflected in any of the policy document in India. The concept of disability impinges upon the concept of inclusion. In other words, if disability is exclusionary and can be listed, inclusion is paradoxical. If disability is due to interaction resulting between impairments of the individual and also of the environment consisting of physical and attitudes of others, it can be improved upon or included. Therefore the meaning of disability in policy document occupies important place for inclusion.

The word inclusion has two inherent concepts of equity and quality. It means include an individual on equal basis as others for same quality of experiences. If the impairment of the individual is limiting condition, inclusion is difficult if not impossible. But if the cause is 'interaction' between two types of impairments, inclusion is feasible by removing two impairments so that interaction is smooth. Therefore identification of both types of impairments is important for inclusion. Indian policies are found deficient with regard to identification of environmental barriers and attitudinal barriers in definitions. Though the activities funded in the schemes are found supportive of equity and quality but the impact of these activities is insignificant on ground.

It could be due to the gaps in the definitions of these terms in various policy documents. As evident from the time line of policies, schemes were launched prior to the legislative policies. The paradigm shifts in definitions could not be taken care of by already existing schemes. Therefore the results on ground as found by survey are not directed towards inclusion. The gap may get reduced if the schemes are redesigned in the light of new paradigm shifts. It also reflects upon policy making processes to be streamlined in India.

CONCLUSION

Earlier discussion shows that the concept of inclusion is well rooted in the political and legal context of India. It is supported by the Constitution, Acts and through government schemes and programmes. However, it is also observed that transition of concept is partial as concept of disability and inclusion is not in consonance with the latest concept as given by UNCRPD. The other two concepts of equity and quality, integral to the concept of inclusion, are found missing from the policies, schemes and programmes in India. Mainly the concept of integration is found to be supported by the schemes such as SSA and RMSA. Centrally Sponsored Schemes like SSA and RMSA are edifice of education system in the country. If there is deviation or absence of a concept in the vehicle, certainly it would not reach its destination. No doubt, inclusion is found missing as being practiced in the country.

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Endnotes

1. Special education means educating CwD in separate schools.
2. Integrated education means , CwD are studying in the same school but are placed in a separate section. They mix with other students for selected activities.
3. Article 2 (definitions) does not include a definition of disability. The convention adopts a social model of disability. But does not offer a specific definition.
4. Article 1(purpose) reads as " Persons with disabilities include those who have long –term physical, mental, intellectual or sensory impairments which in interaction with various barriers mat hinder their full and effective participation in society on an equal basis with others."

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Journal of All India Association for Educational Resaerch
Vol.29, No.2, pp.50-62, December 2017

AN EVALUATION OF THE TWO - YEAR B.ED COURSE IN NAGALAND : INITIATIVES, ISSUES AND THE WAY FORWARD

Buno Liegise
Khotole Khieya

In the context of rapid changes taking place in the schools in Nagaland, teacher preparation has become a primary concern. Several initiatives have been taken to boost the development of quality school education in recent times, one being the introduction of the new two-year B.Ed course in 2015 as per the National Council of Teacher Education (NCTE) norms. Since then much as been expressed on the issues that have been encountered in the process of implementation of the course such as the prolonged duration of the course, the fee hike, the contested value of the degree, the difficulties to get cooperating schools for internship and the like. A relook into the efficacy of the two-year B.Ed Course is highly warranted and robust plan drawn up in the best interest of children's education.

INTRODUCTION

The school landscape is changing rapidly in Nagaland, as elsewhere in the country, with the launch of several flagship programmes of the Central Government, such as the *Sarva Shiksha Abhiyan* (SSA), *Rastriya Madhyamik Shiksha Abhiyan* (RMSA) and more recently the *Right to Education (RTE) Act* 2009. The State of Nagaland experienced an additional paradigm shift when the State Government introduced the *Communitisation of Elementary Education in Nagaland, 2002*, wherein the State Government transferred the management and ownership of the Government primary and middle schools to the community.

All these educational schemes and policies have made huge impact on school education in all aspects – infrastructure, management and

administration, curricular and co-curricular, pedagogy, teacher education and training to mention a few, with both positive and negative results. These changes have been introduced within a short span of time and so in a way causing uncertainty in many schools particularly in the rural areas. In such a situation it has become necessary for teachers to understand the new educational schemes and policies, on the one hand, and the best way of implementing them. Quality teacher preparation has become of utmost importance today.

SCHOOL EDUCATION IN THE CONTEXT OF UNTRAINED TEACHERS

The edifice of school education in the State is expanding by the years and with it the number of teachers and students. The type and number of schools by the number of teachers - trained and untrained, in Nagaland, 2007-2008, is given below in Table No. 1

Table No. 1

Type of School	Number of Schools	No. of Teachers	No. of Untrained Teacher
Higher Secondary	69	2394	1803
High School	337	6628	5202
Middle School	465	5804	4702
Primary School	1162	7956	4995

Source: Government of Nagaland (2013) *Statistical Handbook of Nagaland*. Department of Economics and Statistics, Kohima.

One serious concern in all of this is, the number of trained teachers have not caught up with the ever increasing number of teachers. The overall percentage of untrained teachers in schools of Nagaland in 2007-2008 stood at 74% as seen in Table No. 1. It may be noted that the present

status of trained/untrained teachers in the State is not readily available. The picture may have improved to some extent, but it may not have drastically changed in the recent past. Hence, it may not be out of turn to say that much remains to be done in the field of teacher education.

There is an urgent need to improve the quality of teachers to improve the quality of school education. A nation that wants to progress and rise in the comity of nations therefore cannot afford to sideline the preparation of its teachers. Herein lies the urgency to push for quality teacher preparation programmes in the state.

BRIEF HISTORY AND STATUS OF TEACHER EDUCATION IN NAGALAND

The history of teacher education can be traced to the establishment of Nagaland College of Teacher Education in 1975 by the Government in Kohima. After twenty years, in 1995, Salt Christian College of Teacher Education Dimapur started its B. Ed. course. This was followed by the Bosco College of Teacher Education Dimapur in 2003. The latter two colleges are private institutions. It was only recently that five more colleges of teacher education was set up, namely, Mokokchung College of Teacher Education, Sazolie College of Teacher Education Kohima, Modern Institute of Teacher Education Kohima, Unity College of Teacher Education Dimapur, Ura College of Teacher Education Kohima and the Mount Mary College of Teacher Education, Dimapur.

Today there are nine colleges of teacher education in the State - two government and seven private colleges. While the IGNOU began offering B. Ed. course through distance mode in 2002 and the Certificate in Primary Education (CPE) in 2005, the latter programme has since 2009 been discontinued. The State Council of Educational Research and Training (SCERT) and the National Institute of Open School (NIOS) are providing D.El.Ed course for primary school teachers. There are six

Government District Institutes of Education and Training(DIET), and two private institutions offering pre-service teacher education course for primary school teachers.

The most popular course of teacher preparation in Nagaland appears to be the Bachelor of Education Course. A glimpse of the growth and development of colleges of teacher education in Nagaland providing 2 year B. Ed. is given below.

PROFILE OF COLLEGES OF TEACHER EDUCATION IN THE STATE

All the nine colleges of teacher education in Nagaland - 7 private and 2 Government Colleges that provide the 2 year B.Ed. programme are affiliated to the Nagaland University. The two Government colleges of teacher education functions under the Directorate of Higher Education, Government of Nagaland, while the seven private colleges of teacher education are being managed by private societies/organizations.

Table No. 2
Number of Teacher Educators and Student-Teachers in the Colleges of Teacher Education, 2018 in Nagaland

Name of the Institution	No. of Students		No. of Teachers
	1st Year	2rd Year	
1. Modern Institute of Teacher Education	100	99	08
2. State College of Teacher Education	100	102	15
3. Bosco College of Teacher Education	99	97	13
4. Mokokchung College of Teacher Education	56	65	08

5. Mt. Mary College of Teacher Education	100	95	16
6. Salt Christian College of Teacher Education	100	96	10
7. Sazolie College of Teacher Education	50	52	08
8. Unity College of Teacher Education	100	98	12
9.Ura College of Teacher Education	100	100	09

The student-teacher intake capacity is two hundred for most of the colleges of teacher education providing B.Ed., however, the number of faculty in most of the colleges are not adequate. In this regard, it may be noted that the colleges are in a transitory period of moving from having one unit to two unit of student intake capacity and the colleges seem to in the process of recruiting faculty.

Most of the colleges and institutions of teacher education have hostels for the student-teachers. All institutions have library and laboratory facilities even if access to computer and internet connectivity is still limited. All the colleges organise a variety of co-scholastic activities - games and sports, red-ribbon clubs, social works, variety cultural shows to cite a few. The two Government colleges of teacher education are Sl. No. 2 and 4. All the rest are manned by private societies.

THE TWO- YEAR B.ED. STRUCTURE & CURRICULUM : INITIATIVES

All the colleges of teacher education have started the 2 year B.Ed. course in July, 2015-16. The last of the one year B.Ed. Programme in Nagaland ended in December 2015. The present course is spread over four semesters beginning from January to June and July to December every year. It has

120 working days in a semester excluding examination and admission days. The course is made up of nine core papers, one optional papers and one pedagogy paper and four papers on Enhancing Professional Capacities (EPC). The practical works include pre-internship, Internship at school and post internship, school-based activities and observations, co-curricular activities and work experiences.

SEMESTER I

Paper Code	Title of the Paper	End Semester	Sessional works	Total	Credit	Teaching Hours
Course 1	Child hood and Growing up	70	30	100	4	64
Course 2	Contemporary India and Education	70	30	100	4	64
Course 3	Language across the curriculum	35	15	50	2	32
Course 4	Understanding discipline and subjects	70	30	100	4	64
EPC 1	Understanding Self	25	25	50	2	32
Total		270	130	400	16	256

SEMESTER II

Paper Code	Title of the Paper	End Semester	Sessional Works	Total	Credit	T.hrs
Course 5	Assessment for learning	70	30	100	4	64
Course 6	Learning and Teaching	70	30	100	4	64
Course 7a	Pedagogy of school subject (any one): Methodology of Teaching English Part-I / Social science Part-I/ Science Part-I / Mathematics Part-I	70	30	100	4	64
EPC 2	Drama and Art in Education	25	25	50	2	32
Total		235	115	350	14	224

SEMESTER III

Paper Code	Title of the Paper	End Semester	Sessional Works	Total	Credit	T.hrs
Course 8	Knowledge and Curriculum	70	30	100	4	64
Course 9	Gender, School and Society	35	15	50	2	32
Course 10	Creating an Inclusive School	35	15	50	2	32
Course 11	Optional Course (any one) Vocational /work Education / Guidance and Counselling / Health and Physical Education / Peace Education / Fundamentals of Horticulture & crop production	70	30	100	4	64
EPC 3	Critical Understanding of ICT	25	25	50	2	32
EPC 4	Reading and reflecting on texts	25	25	50	2	32
Total		260	140	400	16	256

SEMESTER IV

Paper Code	Title of the Paper	End Semester	Sessional Works	Total	Credit	T.hrs
Course 7b	Pedagogy of school subject (any one) : Methodology of Teaching English Part-II / Social science Part-II / Science Part-II / Mathematics Part-II	70	30	100	4	64
Course 12	Internship		250	250	10	200
Total		70	280	350	14	264

Total marks =1800 Total Credit = 60, Total working hours=1000 hours

EMERGING ISSUES AND CHALLENGES OF THE TWO - YEAR B. ED. COURSE

Following the promulgation of the new 2 year B.Ed. and M.Ed. Programmes by National Council of Teacher Education, the Nagaland University decided to adopt the revised two year B.Ed. Course from July 2015-2016 session onwards. The syllabi for the new two year courses have been worked out in line with the NCTE guidelines and also incorporating elements that are relevant in the context of Nagaland.

Consultation with experts was conducted. Several rounds of deliberations were held with the principals and the University teachers and officials. A 3-day workshop on *Development of Curriculum for 2 year B.Ed. and M.Ed. programme in Nagaland* was held from 5 - 7 May 2015. The draft syllabi thus framed have been passed by the respective Boards of Professional Studies (B.Ed.) and passed in the School Board of Humanities and Education. The syllabus of the course was approved by the Academic Council of the University in June 2015, and thus the journey of the 2 year teacher education programme started in July 2015.

The State of Nagaland is standing at the threshold of the 2 year B.Ed. programme. As expected, much has been expressed on the issues and challenges of the new course. It has become practically almost impossible for an in-service teacher or an aspirant teacher, after the three-year Bachelors Degree, to afford two more years to do the B. Ed. course - money-wise, time-wise, career-wise and family-wise, since the time duration has become twice longer, the fee of the new two-year course has doubled the one-year course, while the value of the course remain the same!

Then again, there is the question whether the quality of teacher have improved proportionately in terms of the extended period of the programme to 2 years? The premise of the 2 year programmes, of course, is that there would be thorough training of student-teachers and thereby improves the quality of student-teachers. However, till today there has

not been any serious study conducted to assess the impact of the two-year B.Ed course on the quality of teachers in the State. Perhaps, what also needs to be kept in mind and also examined is whether the difficulties/ issues that arise as a result of the prolonged period far outweigh the merits of the two-year course? Moreover, college authorities have underlined the huge investment they have to make on infrastructure facilities, which is taking a toll on the financial resources of the colleges.

Another much talked about issue is that too much focus has been given to the internship period in the new B.Ed. programme with as many as five months earmarked for it. When in Nagaland, as in many other states, CTEs were struggling to get schools to cooperate with them to allow their student-teachers to practise their forty lessons in the schools for a month, one can only imagine how the schools would afford basically five months time to these student-teachers to do their internship? Many schools are reluctant to allow such practices to disrupt their school annual academic calendar. There is also the question of the student teachers using the constructivist approach to teaching and learning. This new approach which has been advocated with the introduction of the new NCTE curriculum, it appears, is usually not approved by the schools as it is starkly different from the traditional way of teaching in the classrooms.

Perhaps, this problem may not arise for in-service teachers as they can practise in their own schools and experiment with the new teaching method. But in Nagaland there are pre-service teachers who are pursuing B.Ed. course along with the in-service teachers. In such a scenario, one is beginning to think whether B.Ed. course should be extended to in-service teachers only? Which would mean that only when a person gets a teaching job in school would s/he would be entitled to apply for the B.Ed. programme. Such and many more queries are being raised in many forums and meetings.

SUGGESTIONS FOR IMPROVEMENT OF THE TWO -YEAR B.ED COURSE: THE WAY FORWARD

A relook of teacher education programmes at all levels is warranted at this juncture in the light of the changes that have been introduced as a result of the new educational policies and Acts related to school education, above all in the context of the revised two-year B.Ed. programmes launched in the country.

1. Notwithstanding the recent spurt in the growth of colleges of teacher education by both private and Government initiative, there are still several aspects of infrastructure facilities that must be strengthened. The library in some of the CTEs and the laboratory in almost all the colleges must be improved and robust plan drawn up to provide state-of-the-art facilities in the near future. The State Government may plan for establishing, for instance, central libraries and laboratories in major towns in the State in phase-wise manner, so that every teacher educator and student teacher can have access to such facilities, which will go a long way in leveraging the quality of teacher education.

2.Information Communication Technology which occupies a central place to transform teaching- learning process in such a way that it enhances learning and at the same time also stimulates creativity deserves a special place in the curriculum. It may be well advised for colleges/institutes to gradually adopt features of smart classrooms to increase productivity and boost innovation.

3.Apart from the B.Ed. course, the Government should look into the merits of introducing several short-term courses in a variety of disciplines to retrain and refresh its primary/middle/secondary school level teachers. There is a growing concern of school teachers relying heavily on outdated teaching methods and techniques.

4.Teacher absenteeism, proxy teaching, lack of discipline and dedication is eroding the quality of school education in the State. Hence maintaining professional ethics must begin from the colleges of teacher education by teacher educators and student-teachers. The Authorities should enforce the rules and regulation in the CTEs throughout the entire period of training. Pledge-taking ceremony can be made an integral part of all teacher education courses so as to underline the importance of professional ethics.

5.Teacher education institutions and the Nagaland University, should draw up plans to rekindle interest among teacher educators and student-teachers for research and innovation. Institutions should provide scope and incentive for conduct of serious high impact research projects. Inter-disciplinary approach of investigation into various methods of teaching and construction of instructional materials may be encouraged.

6.The cloud (read anomalies and complexities) that has engulfed teacher education in many parts of the country as a result of the new teacher education policies and programmes should be addressed and the new policy reviewed in a year or two in the light of practical difficulties that are arising in the process of implementing the revised two-year B.Ed programmes in the country, particularly, in the North Eastern states of India. For one, the behaviourist approach to teaching and learning, which has been in existence for a long time, cannot be totally replaced with the constructivist approach in the present school setup. Hence, it is suggested that teachers combine the best aspects of both the approaches, and training in this regard may be organised. Besides, whereas the EPC courses like the Drama and Arts in Education have been well received by the student teachers in the colleges, the college authorities are facing immense difficulty to find qualified manpower to teach the course.

7.A policy may even be suggested that the B.Ed. programme be provided to only in-service teachers. After all, not all who undergo B.Ed. programme become teachers in the long run, which is a wastage of time, energy, money and more. Besides, the Government can also then strictly follow a recruitment policy that will ensure that only trained teachers can be appointed in the schools. Such a policy will improve the quality of education and also check the inflow of non-serious teachers.

Where the two-year B. Ed. Course will go from here is anybody's guess. If writings in the newspapers *(The Telegraph,* Plan to Scrap the 2-year B.Ed., Sat, September 15, 2018*)*, are to be believed at all, the two - year B. Ed. Course may even be scrapped altogether. Meanwhile, all out efforts are being made to promote the integrated course - BA-B.Ed./ BSc-B.Ed. It appears that teacher education in the country is in a state of flux and engulfed in speculations, which is, to say the least, adversely affecting the general health of education.

However, as of now, what 'knowledge workers' can do is to relook into the relevance and efficacy of the two-year course in the interest of the entire nation. The NCTE must have the courage to conduct an impact study and take any course correction(s) that may be necessary. The sooner that is done, the better. Meanwhile, what stakeholders can do for now is to meticulously plan, prepare and implement two-year course in the best way possible and await the response of the NCTE.

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Journal of All India Association for Educational Resaerch
Vol.29, No.2, pp.63-82, December 2017

GOODS AND SERVICES TAX: A CRITICAL ANALYSIS IN CONTEXT TO ACCESSIBILITY, HUMAN RIGHTS AND EDUCATION OF PERSONS WITH DISABILITIES

Rajendra Prasad

Government of India has notified Goods and services Tax (GST) in 2017 as a great economic reform for strengthening economy of country. This paper tends to analyze the Goods and Services Tax in context to accessibility, human rights and education of persons with disabilities (PWDs). Disability and inclusion is a significant issue but it is an ignored panorama in educational research. Secondary data was used to support and justify the arguments and logics. The analysis reveals that GST will influence adversely accessibility, human rights and education of PWDs. Philosophy of inclusion to PWDs has not been addressed adequately. GST is a discriminatory and exclusionary practice to PWDs. It is not only counters with national law but also with international law. It will make assistive technology costly. The case of Brazil and Philippines is given as a model to exempt PWDs from tax, and make GST inclusionary to PWDs.

INTRODUCTION

In India, there are 2.68 cores persons with disabilities (Census report, 2011). Surprisingly, total population of persons with disabilities (PWDs) in India is more than total population of many other countries of the world. For instance, Cuba, Qatar, Australia, Kuwait and Sweden (World Atlas, 2017). PWDs is an under privileged group of Indian Society. Students with disabilities experience various kinds of exclusion which prevent and limit them to participate in society, family and community life. They have to face many barriers in different phases of life. The attitudinal and institutional barrier influences them most. An attitudinal barrier refers to any kind of psychological harassment while an institutional barrier refers to discrimination through policy and law. Economic Experts considered that Goods and Service Tax (GST) is a great economic reform to country.

But one of the greatest human grounds has been ignored. GST has been put as extra financial burden on PWDs. According to report of GST Council (2017) under chapter 87, 90, and 91 of GST rate schedule for goods .GST has been imposed ranged 5% to 18 % on assistive technology/ devices such as Braille typewriters, Braille watch, Braille paper, and orthopedic appliances. These appliances are very much important and essential to persons with disabilities. Assistive technology is an umbrella for PWDs which enable them to be independent in movement and support in education, and employment. Assistive technology contribute a lot in improving academic achievement of PWDs (UNICEF, 2014) But now, appliances would be more costly. Subsequently, it would influence accessibility, employment, education and daily life of PWDs. Generally, the economic condition of PWDs is not much good. Many poor PWDs have to look towards charity for assistive devices, orthopedic appliances, and its implantation. They are dependent on their family to fulfill different requirements of daily life. It enables many states of country to think for granting financial assistance in the form of monthly pension and other assistance .Uttar Pradesh Government has increased monthly pension Rs 300 to 500 and exempted debt of Rs. one lakh recently. One side, Government is expressing sympathy towards PWDs addressing them as 'Divyang' while another side, instead of granting subsidy for assistive devices and orthopedic appliances; extra financial burden has been imposed as GST. Unfortunately, many disability organizations have to come on road to protest this decision of GST council. Therefore, this article would analyze. How GST would influence accessibility, human rights, and education of PWDs.

This paper is structured into five sections; first, based on secondary data, an attempt provides a fact finding analysis of SWDs with reference to education in general and particular in higher education. Second section, covers influence of GST on accessibility, education and human rights. Treading further, in third section, this paper attempts to provide

contradiction of GST with international legal framework, and best international practices. In the last section it provides some constructive suggestions to solve the problem and inclusion of PWDs in mainstream of society.

EDUCATIONAL STATUS OF STUDENTS WITH DISABILITIES (SWDS) IN INDIA: A FACT FINDING ANALYSIS

Education is not merely reading, writing, and passing examination. It is pillar of all round development of students. Education is the most important component of empowerment to all sections of society. The literacy rate amongst PWDs in India is only 54.5% which is very much lower as compared to 74% of national literacy rate (The census report, 2011). Similarly, the representation of SWDs in higher education is also very critical. Indian higher education is one of the largest education system in the world. There are 799 Universities and 39071 colleges where 34.6 million students are enrolled which constitute 18.6 million boys and 16 million girls. The total Gross Enrolment Ratio (GER) in higher education in country is 24.5%. It is 25.4% for male and 23.5% for female. As regard to social category, GER stands 19.9% for scheduled caste and 14.2% for scheduled tribe. But unfortunately, as far as concern of SWDs, the figures of enrolment in higher education sector are very poor and critical. Only 74435 students are enrolled in higher education which constitute 39718 male students with disabilities (MSWDs) and 34717 female students with disabilities (FSWDs) as reported by (AISHE 2015-16) .The enrolment of FSWDs is lower as compare to MSWDs. The social category wise share of PWDs in higher education sector is too much low particularly in scheduled tribe category where only 2.5% PWDs are enrolled which shared 2.7 % of MSWDs and 2.3% of FSWDs. In case of PWDs of other backward class, 32.6% PWDs are enrolled which constituted 31.2% of MSWDs and 34.2% of FSWDs whereas the figures are very much critical for schedule caste. Only 10.9% PWDs are enrolled in higher education which represents 9.9% of MSWDs and

11.9% of FSWDs in higher education. The persons with disabilities (Equal opportunities Protection of rights and full participation) Act (1995) directed to all Government institutions and other institutions (which are receiving funds on the name of aid) to secure 3% seats for SWDs. Now reservation increased 3% to 5% in its amendment (RPWD Act, 2016.) In spite of having reservation, surprisingly, the figure reported adverse representation and share of SWDs in higher education. If we analyze the statistics given in Table - 2, it is very disappointing that state wise enrolment distribution of SWDs in higher education is very low in various states and UTs such as Andaman & Nicobar (20), Arunachal Pradesh (72) , Dadra & Nagar Haveli (19), Daman &Diu (1), Goa (46), Lakshadweep (0) , Manipur (86), Meghalaya (46), Mizoram (8), Nagaland (20), Pondicherry (166) ,Sikkim (5) , Tripura (127), and Uttarakhand (393) .The above statistics are sufficient to understand the critical situation of SWDs and mostly students are still out of higher education system which is prolonged exclusion. Indian higher education system fails to accommodate students with disabilities in its structure. Therefore, let's analyze. How would GST influence this underprivileged section of society (PWDs)?

Table 1

Social Category Wise Distribution of SWDs in Higher Education

Category	% Out of Total PWD Male	% Out of Total PWD Female	% Total PWD	Female per hundred male
Total	-	-	-	87
Schedule Caste	9.9	11.9	10.9	105
Scheduled Tribe	2.7	2.3	2.5	75
Other Backward class	31.2	34.2	32.6	96

Source: All India Survey on Higher Education (AISHE, 2015-16)

Table 2
State Wise Enrollment of SWDs in India

State & UT	SWDs in India		
	Male	Female	Total
Andaman & Nicobar Island	13	7	20
Andhra Pradesh	1185	765	1950
Arunachal Pradesh	48	24	72
Assam	458	282	740
Bihar	1663	799	2462
Chandigarh	195	70	265
Chhattisgarh	343	158	501
Dadra & Nagar Haveli	9	10	19
Daman & Diu	0	1	1
Delhi	2470	1301	3771
Goa	31	15	46
Gujarat	1042	555	1597
Haryana	344	240	584
Himachal Pradesh	280	323	603
Jammu & Kashmir	349	223	572
Jharkhand	416	187	603
Karnataka	2314	1856	4170
Kerala	1415	1807	3222
Lakshadweep	0	0	0
Madhya Pradesh	1939	1221	3160

Maharashtra	3265	2525	5790
Manipur	35	51	86
Meghalaya	31	15	46
Mizoram	5	3	8
Nagaland	12	8	20
Odisha	757	517	1274
Puducherry	110	56	166
Punjab	488	454	942
Rajasthan	1268	1175	2443
Sikkim	2	3	5
Tamil Nadu	3161	2112	5273
Telangana	1414	1022	2436
Tripura	109	18	127
Uttar Pradesh	12124	15868	27992
Uttrakhand	308	85	393
West Bengal	2115	961	3076
All India	39718	34717	74435

Source: All India Survey on Higher Education (AISHE, 2015-16)

ACCESSIBILITY, HUMAN RIGHTS AND EDUCATION OF SWDS : INFLUENCE OF GST

The loco motor disability is listed under the rights of person with disability act, 2016 which means that 'a person's inability to execute distinctive activities associated with movement of self and objects resulting from affliction of musculoskeletal or nervous system or both'. The orthopedic appliances play a significant role in compensating for a defect or impairment or disability. Generally, these appliances are either carried or worn or implanted in the body of PWDs which help them in

movement from one place to another place but surprisingly, 12% GST on orthopedic appliances has been imposed by GST Council, 2017 which includes surgical belts and trusses, crutches, splints and other fractures appliances, and artificial parts of body, etc. Additional expenditure would create financial problem for poor families of PWDs and limit their movement. The movement is very important in the life of every person. GST would hamper the movement of orthopedic disabled. The independency in movement makes life more qualitative and happy while dependency on others may hamper the self - concept of PWDs. When PWDs go to attend the education institutions they not only go to attend the classes but also visit the library, hostel, computer lab, bank, post office, and other administrative offices, etc. The classes of the schools and higher education institutions are not disability friendly. Even, the furniture of classrooms is not suitable to orthopedically disabled due to non-sufficient gap between desks or chairs. They cannot fold or straighten the leg when they feel the pain. Hence, underdeveloped infrastructure is already present as a barrier in education sector whereas another side the taxing of 12% GST on orthopedic appliances would be another financial barrier particularly to those PWDs who are poor and could not afford the high cost of orthopedic appliances and look towards charity.

The transportation system is also a great barrier in education and employment of PWDs. Generally, buses, and trains are being used to attend the educational institutions and employment offices by PWDs. But it is very difficult for them to get in and get off alone due to non-disability friendly transportation system. There is worst situation in nuclear families where father is only source of earning bread and butter. Naturally in the working class nuclear families, it is neither possible for father to leave his job and accompany the PWD child to educational institutions nor it is possible to arrange an escort. Therefore, when PWDs crossed the adolescence period the guardians generally prefer to arrange a disability friendly hand control car so that PWDs may attend the

educational institutions independently but unfortunately, 18% GST has been imposed on disability friendly car. The market prices of disability friendly Wheelchair Van Car with lift is approx. Four Lakh (Mobility Aids Sale and Service, 2017). If we add 18% GST, It will be four lakh seventy thousands. Thus, PWDs have to pay seventy two thousands extra while as report of planning commission, chaired by Rangrajan (2014) mentioned that 29.5% of total populations of India still fall under below poverty line (BPL). Hence, this assistive disability friendly Wheelchair Van Car with lift would prove very expensive and out of affordable capacity of persons with disabilities. At the result, many PWDs have to look forward for donation not only for orthopedic appliances but also for disability friendly Wheelchair Van Car with lift. Here, it is very important to point out that Jagadguru Rambhadracharya Handicapped University, Chitrakoot, UP, was established in India by a blind saint (Jagadguru Rambhadracharya) which is completely dedicated only for higher education of PWDs where all kinds of PWDs take higher education under one roof. Another University (Dr. Sakuntala Mishra Rehabilitation University, Lucknow) based on module of inclusive education was established where both general and PWDs share 50% seats equally. Therefore, number of SWDs comes to take higher education from different parts of country. Even, PWDs from North-east India are also studying in these universities. Apart this, they also approach to rest of Universities and National institutions of country. Train is main source of travelling. Indian Railway provides train tickets to PWDs on concessional rate. But under the GST, 5% GST has been imposed (IRCTC 2017). No point of time, it has been quoted that PWDs would be exempted from GST for train tickets. Apart from it, those PWDs who are suffered from severe disability have to travel with an attendant/escort. The cost of train ticket of attendant/ escort is already an additional burden. In this scenario GST would also be an extra financial burden. If they choose Rajdhani train for travelling then they have to pay dynamic fair and catering charges extra. Hence, GST would create difficulty to SWDs to go outside for study.

Let's further analyze GST, transportation and employment. As regard to employment of PWDs, Singh (2014) stated that "PWDs are involved in both paid and unpaid work. MWDs do paid work while FWDs do unpaid work like domestic work". The poverty alleviation programme like MANREGA doesn't have any provision for employment of PWDs. Similarly, NCPEDP(2009) conducted a survey in top 100 Multinational Companies and reported that the rate of employment of PWDs in private sector is only 0.28% which indicates about worst employment status of disabled people . The door of private sector is almost closed to them. They are not under employment agenda of Multinational Companies. Market provisions are insufficient to cater the needs of PWDs as market stimulates to price, selling, purchase, profit to increase assets. PWDs are considered as unskilled labour. However, some of PWDs have employment and have to attend employment office to earn bread and butter. 18% GST on disability friendly wheel chair car would reduce the purchasing capacity of PWDs and would create a barrier in attending employment offices. Above evidences are sufficient to make understanding that human rights of PWDs will be influenced negatively?

Normal people can observe everything .The world is full of green scenery to them. But the persons who do not have eyes, the world becomes dark to them. They see the world with eyes of others. They depend for most of the work of daily life on either parents or other family members. Even, they cannot read and write like sighted people. Braille language plays a significant role in education of blind students. Therefore, RPWD Act, 2016 under section 3(v) ,has made it obligatory on the part of the educational institutions to "ensure that the education to persons who are blind or deaf or both is imparted in the most appropriate languages and moods and means of communication". Similarly, section 3(iv) of this act also mandate to goverment and local authorities to "provide necessary support individualized or otherwise in environments that

maximize academic and social development consistent with the goal of full inclusion.''. But unfortunately, Govt. of India has imposed 5% GST on Braille typewriters, Braillers and Braille papers, etc. Originally, 18% GST for typewriters and 12% GST for Braille papers were set up. But it is reduced up to 5% due to protest of various organizations and disability activist like Blind Federation of India, Disability Rights Organization Forum, and National Center for Promotions of Employment of Disabled People (NCPEDP, 2014). The great contradiction is emerged that on one hand , "RPWD Act, 2016" recommended for providing education in most appropriate language to visually impaired persons (VIPs) but on the other hand , Govt. of India is imposing 5% GST on Braille typewriters and braillers which is basic educational tool for VIPs. How is it justified? This is a great question mark, if we analyze the importance of Braille script to blind students. The dream of education to visually impaired students cannot be visualized in absence of Braille language and Braille material. The normal students make notes, read and write in their concerned language like Hindi/ English /Bengali and any other language but VIPs make notes and record the material only in Braille script. They read and write through embossed words of Braille script. Now, the imposition of GST would make Braille equipments more expensive which may be out of purchasing capacity of poor blind persons and their guardians. For instance, the current market price of Braille type writer is about Rs. 35,000 (Thirty five thousands) if we add 5% GST in the market rate of Braille typewriter. It would be Rs. 36750 (Thirty six thousands seven hundred fifty rupees). The market price of Braille typewriter is already too high. After the imposition of 5% GST, it would be more costly. First, if we glance at status of below poverty line (BPL) in India, the figure is still 29.5 % (Rangrajan, 2014). Secondly, the monthly income per capita & per month in rural areas is less than Rs. 972 (Nine hundred seventy two only) while it is only Rs. 1407 (One thousand four hundred seven only) in urban areas (Rangrajan, 2014).Hence, a very justified question arises. How can a father belonging to BPL category

arrange a Braille type writer to his blind son/daughter? Blind persons who are already struggling with societal and attitudinal barriers. GST would be an additional financial barrier. How will they come in the mainstream of society? When PWDs themselves require support, how can they be a support to economy of country by paying GST for basic assistive devices to survive in the field of education? RPWD Act, 2016 under section 1(m), has made a comprehensive definition of 'High Support' means an intensive support, physical, psychological and otherwise, which may be required by a person with benchmark disability for daily activities, to take independent and informed decision to access facilities and participating in all areas of life including education, employment, family and community life and treatment and therapy. Hence, legally, Govt. of India must grant high support but surprisingly, Government has imposed GST on basic assistive devices of PWDs.

Another very important assistive device i.e. Braille watch is also under 5% GST regime. First, Let us analyze. How is the Braille watch work and assist to PWDs? The Braille watch is standard smart device. It has twenty four sensors in form of embossed Braille dots. VIPs touch the embossed Braille dots and judge the real times which help them in making time management. Second significant question is that how would high cost of Braille watch hamper academic performance of blind students? Many Researchers already proved that study habits significantly influence academic performance of learners. Poor study habits is cause of poor academic achievement as reported by researchers (Guadaganavar and Halayannavar, 2014; Aquino, 2011; Ergene, 2011 and Premalakshmi, 2012) . Time management is one of the very important components of good study habits (Palsane and Sharma, 2010). A person, who has the ability to manage the time and make study schedules and distribute time according to interest, subjects, and suitability of environmental conditions, may have high academic achievement. By budgeting time, students can optimize their success in study, extra- curricular activities

as well as different activities of daily life. Braille watch is a significant supportive device to know exact time and make appropriate time schedule for structured study. But 5% additional tax as GST would lead to reduce the purchasing capacity of poor guardians of PWDs (blind). Subsequently, it would hamper time management of PWDs. Thus, GST would make assistive technology more expensive. Therefore, assistive devices and orthopedic appliances must be given at subsidized rate instead of putting tax like GST.

MULTIPLE TAXES: GST AND INCOME TAX

Multiple taxation would contribute a lot in pushing back PWDs from different fields of social life and education. The parents of PWDs have to spend extra money not only on education but also for health, rehabilitation, therapy and guidance and counseling. Now, they would have to buy various assistive devices and aids as per nature/type of disability under new GST regime. This over burden expenditure starts from being disabled and continues until their proper settlement in job and other phases of social life. Despite huge expenditure of parents on rehabilitation, therapy, education, travel, health, guidance and counseling, and consultation with doctor for medical treatment, Income tax is being taken from parents and PWDs themselves. Another side, GST has also been added as sugar and salt. There is a great question how much is justified to take income tax from PWDs and their parents. There is great policy discrimination with PWDs in comparison to other social categories with reference to income tax. The rule of social backwardness is applied in case of tribals who are enjoying 100% tax rebate particularly in North East India but the rule of social backwardness is not applied in case of PWDs. However, Govt. of India has given some relaxation in income tax to PWDs which is just like a drop of water in the ocean.

GST provides safeguard the livelihood of agricultural workers and farmers. The tools which are used for agriculture have been exempted

from GST regime. For instance, shovels, spades, mattocks, cultivators, thresher, etc. Even, the services relating to cultivation, harvesting, threshing, plant protection and processes carried out an agricultural farm like cutting, cleaning, cooling, tending, and sun drying , etc. have been exempted from GST but assistive technologies which are very essential and play a pivotal role not only for education of PWDs but also to be independent and earn livelihood, have been included in the tax items of GST. Govt. of India requires protecting the rights of PWDs similar to agricultural workers and farmers. Exemption to assistive devices and orthopedic appliances of PWDs would be a step to make society inclusive and bring them in mainstream of society and get education.

WHAT INTERNATIONAL LAW AND LEGAL FRAMEWORKS SAYS

The imposition of GST on various assistive devices and orthopedic appliances does not only counter with national law but also with international law. United Nations (UN) placed Convention on the Rights of Persons with Disabilities to states parties (Countries) to sign on 13 December, 2006. India had signed on the convention on the opening day i.e. 30th March, 2007. It was the first convention of United Nations on which highest 82 state parties signed on the opening day. GST has countered with following articles of United Nations Convention of the Rights of Persons with Disabilities, 2007.

> Preamble (J) 'Recognizing the need to promote and protect the human rights of all persons with disabilities, including those who require more intensive support'.
>
> Preamble (o) 'Considering that persons with disabilities should have the opportunity to be effectively involved in decision – making processes about policies and programmes, including those directly concerning them'. No suggestions were taken from disability organizations before imposing GST'.

Article 4 (b) 'To take all appropriate measures, including legislation, to modify or abolish existing laws, regulations customs and practices that constitute discrimination against persons with disabilities'.

Article 4 (g) 'To promote availability and use of new technologies, including information and communication technology, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost'.

Article 5(3) 'In order to promote equality and eliminate discrimination, state parties shall take all appropriate steps to ensure that reasonable accommodation is provided'.

Article 20 (b) 'Facilitating access by persons with disabilities quality mobility aids, devices, assistive technologies and forms of life assistance and intermediaries, including by making them available at affordable cost'.

Article 24 'State parties shall ensure an inclusive education system at all levels and lifelong learning'.

Article 24(2c) 'Effective individualized support measures are provided in environments that maximize academic and social development, consistent with the goal of full inclusion'.

Article 24(34) 'On facilitating the learning of Braille, alternative script, augmentative and alternative modes, means and formats of communication and orientation and mobility skills'.

CONTRIBUTION OF PWDS IN WORLD ECONOMY AND INTERNATIONAL EXAMPLES OF SUPPORTING DISABILITY

The persons with disabilities contributed a lot to the world where their country facilitated the services of health, education, social services, and assistive technology. For Instance, Franklin Delano Roosevelt who was an

orthopedic disabled and used wheelchair became 32nd president of Unites States from 1933 to 1945. A unique work has been done by Jagadguru Rambhadracharya who is blind founded Jagadguru Rambhadracharya Handicapped University in Chitrakoot District of Uttar Pradesh. This University is dedicated only for disabled where all kinds of persons with disabilities get higher education under one roof not only from India but also from other countries of the world. Stephen Hawking the famous physicist who had motor neuron disease yet significantly contributed to the field of cosmology, general relativity and quantum gravity especially in the context of black holes. Helen Keller despite being deaf and dumb became famous American author, activist, etc. John Milton, a completely blind person wrote the famous epic 'paradise lost'. Tilly Aston, was a writer and teacher, who founded Victorian association of Braille writers to facilitate material to blind students. Stevie Wonder, a completely blind person, became the famous musician and singer. Johan Huckleberry suffered from spinal cord injury and became famous journalist and author. Albert Einstein suffered from learning disability but gave us the Theory of Relativity. Erik Weihenmayer despite being the blind became the first blind person to reach the summit of Mount Everest. Isaac Newton suffered from 'Attention Deficit Disorder' but discovered law of gravitation and Thomas Alva Edison despite being a disabled discovered electric bulb and developed telegraph system and Carbone micro phone. Dr. Janice Brunstrom suffered from cerebral palsy and become leading scientist of neurology in CP Centre Washington University. Tanni Grey-Thompson despite being physically disabled won 16 medals in para-Olympic. The list is endless .Therefore, We need to remove various financial barriers and facilitate assistive technology . Govt. of India needs to make liberal financial policies so that assistive technology may be accessible, affordable, and adoptable to persons with disabilities.

TAX EXEMPTION TO PWDS IN THE WORLD: CASE OF BRAZIL AND PHILIPPINES

There are some practical examples in the world with reference to tax exemption or discount to PWDs. Brazil which is a developing country of the world, has developed a national plan for disabled persons *(The Plano Nacional dos Direites da Pessoa com deficien-viversem limited)* and grant tax reduction for vehicle used for mobility and assistive devices of PWDs. Even, imported assistive devices such as cochlear implants, Braille machines, electronic magnifying glasses, calculators, hearing aids, and wheelchairs , etc are exempted from federal tax (The Brazil Business, 2016).. In addition, Philippines is another good example in the context to India. As per census report of Philippines (2010),1.57% of total populations have different kinds of disability. The republic Act (2007) of Philippines is known as *"Magna Carta for Disabled Persons"* in Philippines .It secures 20% discount on various assistive devices of persons with disabilities along with education. Besides 20% discount has been given on various services and goods in Philippines such as services of hotels, restaurants and recreation centers for exclusively for PWDs, Air, Domestic and sea travelling, Dental and medical services, laboratory and diagnostic fee, Special discount on basic commodities, and Medicine and all other drugs which are exclusively necessary for PWDs.

SUGGESTIONS

In order to address the problems and challenges faced by PWDs following measures may be considered:

GST council should make GST more practical for PWDs. A committee must be constituted to re- examine the matter and solve the problems of PWDs. Taxation policies of other countries of the world for PWDs must be examined to adopt innovative and behavioural practices. Full tax exemption on all imported disability appliances of PWDs must be granted. PWDs and their parents should be exempted from all federal

taxes including GST and income tax to bring them in mainstream of society. Govt. of India should export disability appliances rather than import. Government and Private Companies along with disability organizations should be encouraged to develop disability appliances under 'Start up India' scheme. Parents and PWDs may be invited to take views on design, usability, and evaluation of disability appliances. Foreign investment should be encouraged for development of assistive technology to PWDs under 'Make in India' programme. More liberty may be given to foreign investors to attract them to invest in India to develop disability appliances. Fundamental researches should be promoted under major/ minor research programme of UGC, ICSSR, DST, and other funding agencies of India. Government of India needs to review Goods and Service tax and exempt all assistive devices which are basic requirement of PWDs and their education. Finally, criticism of GST doesn't mean that one is opposed to such measures . We should evaluate GST on the ground of logic, arguments, and its merits and demerits in context to Accessibility, Human Rights and Education of PWDs. On one side, social issues like gender, caste, class, norms, and closed society are already creating barriers. On the other side, neither educational nor employment status of PWDs is satisfactory. Additionally, GST is a discriminatory and exclusionary practice for disabled people's human rights and education. We should examine five very pertinent points/ issues. First, what do we want? Second, what are we doing? Third, do various provisions of GST fit to constitution and the RPWD Act, 2016? Fourth, how can we adopt inclusionary act, schemes, and policies in future? Fifth, how can we make GST practical to PWDs?

ABBREVIATIONS:

PWDs- Persons with Disabilities.

SWDs- Students with Disabilities.

FSWDs-Female Students with Disabilities.

MSWDs-Male Students with Disabilities.

MWDs-Male with Disabilities.

FWDs-Female with Disabilities.

RPWD-Rights of Persons with Disabilities.

GST-Goods and Services Tax.

VIP-Visually Impaired Persons

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Journal of All India Association for Educational Resaerch
Vol.29, No.2, pp.83-100, December 2017

DOES KNOWLEDGE OF MATHEMATICAL LANGUAGE PLAY A ROLE IN MATHEMATICAL ABILITY? -A PRELIMINARY STUDY

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Mathematics has always been associated with knowledge of digits and number words. Limited thought is given to the language system that binds digits and number words for meaningful computation. The lexicons of mathematics such as series of alphabets, numbers and digits become meaningless unless semantics or the meaning component is loaded into mathematical problems. Therefore, language skills related to reading, writing and comprehension are linked to performance in mathematics. In order to understand the role of language in mathematical lexicons, tests were developed for math vocabulary reading and math language incorporating general language vocabulary and syntax. The tests were administered on 47 children studying in IV Grade with Kannada as the medium of instruction. Results indicated poor performance by children on tasks where the general language vocabulary terms are shared between math and language. The study emphasizes the importance of teaching meaning of the mathematical lexicons in the classroom.

INTRODUCTION

Mathematics is often characterized as the language of science. As early as 1975, the superiority of mathematics as a language system is supported by the views of Beilin, supported by Lamb (1980) who attribute successful performance in mathematics to the ability to represent abstract ideas using symbols. Mathematical text reading requires two salient components of language of mathematics- *understanding mathematical*

technical vocabulary and *specialized symbols*. These components are facilitated by the knowledge of language. Children acquire knowledge of mathematical terms through arithmetic processes such as counting, problem solving strategies, working memory, that are necessary for both their daily functional living as well as academic activities. Vocabulary understanding is a major contributor to overall comprehension in many content areas, including mathematics. Effective methods for teaching vocabulary in all content areas are diverse and long standing. Teaching and learning the language of mathematics is vital for the development of mathematical proficiency. Mathematical vocabulary learning by students is an important part of their language development and ultimately mathematical proficiency (Riccomini, Smith, Hughes & Fries, 2015).

The human brain must contain mental representations and processes for recognizing, understanding and producing various notations of numbers for the purpose of translating it from general language to the language of mathematics. The number domain, therefore, provides an interesting dimension to study the representation of symbolic information in the human brain and the interplay between language (verbal) and number symbols (non-verbal) forms. The study of organization of number system in human brain would possibly throw light on the organization of linguistic domains related for processing number symbols.

The relationship between language and mathematical symbols has been documented for English language and Arabic numerals consequent to which several models have been proposed. The architecture for mental representation of numbers and their interconnections are detailed in McCloskey's modular model of number processing (1992) in which a single central abstract quantity representation interfaces with notation-specific input and output modules. On the other hand, the triple-code model (Dehaene and Cohen, 1995) describes both the functional architecture and the neural substrates of number processing accounting

for many types of numerical deficits, widely known as acalculia / dyscalculia, generally defined as a developmental arithmetic disorder leading to failure to develop arithmetic competence. Children with dyscalculia may make a variety of errors during math performance due to difficulties in understanding numbers, counting skills, computational skills and solving problems. Kosc (1974) suggested that dyscalculia could occur in different combinations and also with other impairments. Owing to the significance of number processing, there is greater awareness in the past few decades that difficulties in mathematics frequently occur concurrently with language difficulties (Chinn and Aschroft, 1993). In general, the neuropsychological models of number processing attempt to explain manipulation of numbers using Arabic notation, spelled-out numerals or as an abstract quantity representation accounting for certain inabilities manifested by children with dyscalculia.

While literature is available for English language and Arabic numerals, similar studies in non-English languages are scanty. Kannada, a Dravidian language has terms that are borrowed as its origin is from Sanskrit. For example, the specific lexicon of mathematical terminology such as '*dashaka*' in Kannada language means 10's; terms used for general language purpose, such as '*hadi*' indicating the teen numbers which is also symbolically used to represent the meaning of 'teen age' (*hadi haraya)*; the bilingual lexicon (the term 'bilingual' is used here to indicate words that cut across general language and mathematical language as explained in the examples) such as '*kaalu*' meaning 'quarter' (specific mathematical lexicon), and '*leg*' (general language lexicon) in Kannada language has not been studied till date. There is a need to understand its relevance to develop suitable tests and remedial programs for children with dyscalculia. The origin of mathematical symbols, the semanticity of abbreviations used in mathematics and the bilingual nature of numerals is language specific and therefore, is an important area of study to evaluate the relationship among language-reading-mathematical symbols.

The relationship among language, reading and mathematics can also be drawn from several other examples. Reading numerals is similar to reading alphabets or letters (2, 3, 4 as numerals as against a, b, c as alphabets); reading combinations of mathematical symbols that form mathematical lexicon (for example, 2x) is similar to reading words; need to interpret words with differential meaning in general language compared to mathematical language based on the context (for example, square, root, point, slope, etc.,) is closer to the semantics of language. For example, in Kannada, /*hattu*/ meaning 'climb' is used to denote number 'ten'(10); /*elu*/ meaning 'get-up' to denote number 'seven'; words with multiple meanings in mathematics ('square' would mean 'a geometric figure' or a 'mathematical operation') is used as /*chouka*/ in general language meaning 'square' as well as 'towel'. Common mathematical root words in English with different suffixes such as multiply, multiplier, multiplication and multiplicand for which the equivalent words in Kannada are also confusing (/*gunaka*/ 'multiplier'; /*gunya*/ 'multiplicand'; /*gunalabdha*/ or /*shesha*/ 'answer') as it requires morphosyntactic knowledge; Further, the mathematical sentences (for example, 3+3=5) that do not conform to traditional sentence patterns pose additional challenges. The above examples suggest that there is a need for children to develop the ability to derive context specific meaning since communication in mathematics is primarily a linguistic behavior. Schleppegrell (2007) conducted a review of research by applied linguists and mathematics educators that highlighted the pedagogical challenges of mathematics. The review suggests that since the mid-1980's researchers have been pointing to ways that language is implicated in the teaching of mathematics. A key influence has been the discussion by Halliday (1978) on the 'mathematical register'. Halliday pointed out that counting, measuring, and other 'everyday' ways of doing mathematics draw on 'everyday' language, but that the kinds of mathematics that students need to develop through schooling use language in new ways to serve new functions, such as mathematical performance (Schleppegrell, 2007).

The different aspects of language involved are indicated by the summary of key linguistic features of the mathematics register. There are a few studies examining mathematical ability among children with learning disability (Geary, 2004) reading disability (Jordan, Hanich & Kaplan, 2003; Fuchs & Fuchs, 2002), and specific language impairment (Fazio, 1994) as well. However, there are not many studies on the knowledge of language of mathematics in typically developing children. Thus an effort is made to explore the language of mathematics and its relation to mathematics performance.

While the bilingual lexicon of general language and mathematical language as explained earlier for Kannada language offers certain challenges for learning, there are also specific challenges within the domain of the language of numbers. When a child is learning in a bilingual medium with English as a second language (ESL learners), s (h) e has to learn two representations for each number, the digit as well as the number word. For example, while the notation using the Arabic numerals would be (4, 40), the spoken number is (/four/, /forty/) and the written or spelt number is (FOUR, FORTY). Whereas in Kannada, the numbers are spoken and written the way it is expressed (/*mu:ru*/ = 3) since the orthography is direct (transparent, with letters and not alphabets). Children receiving education of Kannada medium are taught Arabic numerals even though digits in Kannada are available since Arabic numerals are used as standard notation across the world. Therefore, the bilingual children's brain must contain mental representations and processes for recognizing, understanding and producing these various notations of numbers and for translating across the notations that highlight the complexity in learning mathematical language. This calls for an understanding of the lexicon of mathematical terminologies in the context of children learning in Kannada medium with mathematical symbols being represented using Arabic numerals that is in practice not only in Karnataka State but also across several schools in other States of India.

OBJECTIVES OF THE STUDY

The main aim of the study was to examine the relationship between knowledge of terms in general language as well as mathematical language and mathematical ability in children. Hence, the study was designed with the following objectives:

To construct a math vocabulary reading test in Kannada for children in Grade IV.

To construct a math language test in Kannada for children in Grade IV.

To determine the relationship between reading math terminology, mathematical language and performance on mathematics by Grade IV children.

METHODS

The study was designed with a purposive sample of IV Grade children studying in Kannada medium. 50 children in the IV Grade (only one section per Grade) were screened for intellectual deficiency if any, using *Gessel's Drawing Test (GDT,* Verma, Pershad & Kaushal, 1972) standardized on mentally retarded children and revalidated on clinical population (Venkatesan, 2002). For ease of administration and scoring, selected drawing test items were arbitrarily classified into:

Preliminary domain that consists ten items at or / below 36 months mental age level.

Intermediate copying domain that consists of 25 items for mental age equivalence between 36 to 120 months.

Advanced three dimensional drawing domain that consists of 10 drawing items with three dimensional perspective at or / above 120 months mental age.

Since the children were in grade IV (approximate age range 9-11 years), the preliminary sections of GDT with simple drawings were not administered. All the children were seated comfortably in a chair with a writing table. Paper and pencil were supplied to draw the picture. The GDT was administered as a group test, for which thirty two picture cards were projected on the wall one by one by using an over head projector (OHP) in the classroom. Children were instructed to draw the picture projected on the wall. The pictures drawn by them were rated as average, above average or below average in intellectual functioning but not quantified (for more details on scoring, please see Venkatesan, 2002). 47 children whose performance was in the average and above average range were selected for the study.

Further, the adequacy of sampling was also examined by setting the confidence level at 95% based on Raosoft sample size calculator (http://www.raosoft.com/samplesize.html). The suggested sample size was 45. However, a total of 47 (28 M; 19 F) children were selected for the study. Children who had minimum of three years of formal schooling with exposure to textbook terminologies were selected. Ethical formalities were followed to avail permission, informed consent and cooperation from teachers, parents and children. Data collection was done for a period of two months in the initial term of the academic year.

Test materials

A battery of tests for math vocabulary, reading math terms, test of arithmetic ability were developed / adopted for the study. Screening test of intelligence was administered to rule out intellectual disability. Table I shows the list of tests.

Table 1

List of Tests

Skills	Test	Developed
Knowledge of Math Language concepts	Test of Math Language (TML)	By the investigators in the project
Math Vocabulary Reading	MathVocabulary Reading Test (MVR)	By the investigators in the project
Arithmetic performance	Arithmetic Diagnostic Test (ADT)	Ramaa (1994)
Intelligence screening	Gessel's Drawing Test (GDT)	Venkatesan (2002)

i) Description of tests and administration procedure

a) Test of Math Language (TML)

TML was developed based on the review of vocabulary in the textbooks of Grades I to IV. Vocabulary used in the textbooks was selected to test knowledge of language concepts related to mathematics in participants of Grade IV. The basic concepts which are prerequisites for mathematical skill such as symbol decoding were included in the TML along with technical terms used in math books such as synonyms in math vocabulary and language vocabulary (for example, /*hattu*/ meaning number 'ten' as well as 'to climb' in Kannada language), terms having different meaning in general language usage (for example, /*biDi*/ means units in mathematical context while in language usage, it means both 'request to leave' as an honorific term and also to represent meaning of 'single', 'free'). A total of 60 items were classified into sub sections to assess math vocabulary in TML

The TML comprised of questions with multiple choices, fill-in the blanks and matching tasks. Small groups of 5-6 participants were made to sit comfortably and the TML was administered as a group test. The participants were able to complete the test in one sitting taking

approximately 30 minutes. Each correctly answered item was given a score of 'one'. Total score was 60.

b) Test of Math Vocabulary Reading (MVR)

MVR test was developed based on the math textbooks of Karnataka state syllabus (Kannada) of Grade I through IV. The books were extensively reviewed and a list of words was prepared. All the words in the text that either explained the concept (for example, concept of addition) or used to give instructions to solve problems (for example, addition) were collected. The test was short-listed to sixty words and arranged based on the complexity as per the Graded books.

MVR was administered individually to all the forty-seven participants. They were informed that the test was not for allotting marks and/or grades, but only to note how they read. Each participant was asked to read aloud as many words as possible in the list. They were Approximate time taken by each participant was about 10 minutes. Each correctly read word was given a score of 'one' and the total score was 60.

An item analysis with biserial correlation was carried out for the words in TML and MVR to ensure that the words chosen from the Grade IV text books may be incorporated as test items. Table 2 shows the components and number of items chosen for TML & MVR tests.

Table 2

TML & MVR test components and the number of items

Type of math vocabulary	No. of items
Prerequisite concepts	16
Math terminology	17
Terms with both math and language lexicon	7
Symbol decoding	12
Synonyms	8
Total	60

c) Arithmetic Diagnostic Test (ADT)

ADT was developed by Ramaa (1994) to identify the specific difficulties encountered by the primary school children (Grades I-IV) in solving arithmetic problems. The test covers three major areas of arithmetic namely, number concept, arithmetic processes and arithmetic reasoning. Since the test facilitates diagnosis of arithmetic disability, it includes problems that represent each type and subtype of task to solve arithmetic problem that fall under each major area. Each subtype of the task is represented with two items to examine the difficulties faced by the children in solving arithmetic problem. The sub item and items are arranged in the order of increasing level of difficulty within and between the subsections. The test was administered in small groups. A score of 'one' was given to each correct response. The scores of the addition and subtraction sections of the test were further split into numerical, verbal numerical, verbal-spatial and numerical test scores based on the nature of the task. Table 3 shows the number of items in ADT for Grade IV.

Table 3
Total number of items for Grade IV in ADT

Concept/Operations	Total No. of Items
Number Concept	47
Addition	56
Subtraction	86
Multiplication	46
Division	40
Total No. of Items	275

ii) Content validity, Item analysis and Reliability of the tests

Content validity was established by giving the test items to six experienced teachers and four experts in the field to judge for its appropriateness. . Based on their suggestions suitable modifications were done. The assessment of test reliability was based on the correlations between the

individual items or measurements that make up the scale, relative to the variances of the items. Owing to the time constraint (project was run for a period of 6 months only due to want of qualified research officer) and in view of the literature support (http://www.statsoft.com/Textbook/Reliability-and-Item-Analysis#index), other methods of reliability were not executed. Since Item Analysis aids in the design and evaluation of sum scales, that is, scales that are made up of multiple individual measurements (e.g., different items, repeated measurements, different measurement devices, etc.) through which a researcher can evaluate scales following classical testing theory model the items were subjected to Biserial Correlation. Validity index of each item of TML and MVR was determined by the extent to which a given item discriminates among the examinees on the function measured by the test. In order to carry out item analysis the number of participants who responded to the items correctly in selected upper and lower subgroup was noted. The discriminative power of the item, its consistency with total score on the test is gauged by the correlation of the item with the total test score. The biserial is read from a standard table. As a general rule, items with validity indices of 0.20 or more are regarded as satisfactory, and that items with validity indices lower than 0.20 are discarded. Thus, in TML, two items were re-structured to remove ambiguity. In the MVR the validity index for all the items was 0.20 and therefore all the items were retained in the final version. The test was administered individually to a group of 47 participants of Grade IV.

RESULTS AND DISCUSSION

The data obtained from the Test of Math Language (TML), Math Vocabulary Reading Test (MVR), Arithmetic Diagnostic Test (ADT) was analyzed. Descriptive tests of statistics were employed to examine the performance of participants. Table 4 & Figure 1 indicate the mean scores and SD of boys and girls on each of the tests in the battery with p value derived using 't' test.

Table 4

Mean, SD & 't' test scores in MVR, TML, & ADT

Test	Max. Score	Mean score (Boys)	Mean score (Girls)	t test
MVR	60	36.07 (23.85)	43.84 (24.19)	1.08
TML	60	23.18 (14.11)	27.95 (13.27)	1.16
ADT	120	53.79 (34.93)	62.79 (35.75)	0.86

MVR (Math Voabulary Reading); TML (Test of Math Language); ADT (Arithmetic Diagnostic Test)
N=47 (28 Boys; 19 Girls); $p>0.05$

a) Comparison of performance of boys and girls on TML, MVR, and ADT

Descriptive statistics was used to compare the mean scores on Test of Mathematical Language (TML), Math Vocabulary Reading Test (MVR) and Arithmetic Diagnostic Test (ADT). The results indicated that the girls performed better than the boys on all the three tasks (Figure 1). However, there was no significant difference on 't' test when the performance of boys and girls was compared.

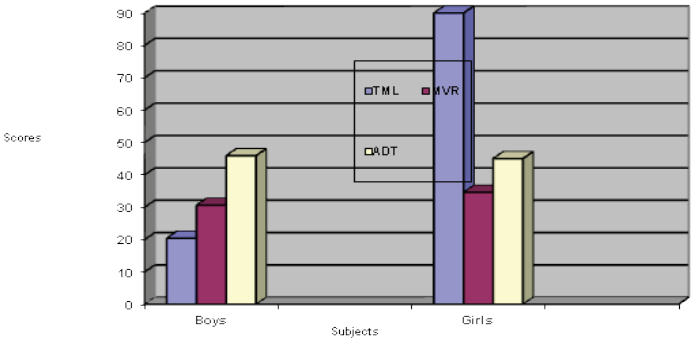

Figure1: Performance of boys and girls on TML, MVR & ADT

b) Comparison of performance of boys and girls in different subtests of TML

The data obtained on the subcomponents of TML was analysed to compare the performance of boys and girls on pre-requisite skills, math technical vocabulary, common terms in both math & language usage, symbol decoding and synonyms. Table 5 shows the details. The mean score difference between boys and girls on subtests of TML shows that girls have performed fairly better than the boys in all the categories of the test, except on synonyms. However, the difference was not significant ($p>0.05$).

Table 5
Mean, SD & 'p' values on sub-tests of TML

Subtests and no. of items	Mean scores (Boys)	Mean scores (Girls)	p value
Pre-requisite skills (16)	8.71 (4.49)	10.32 (4.97)	0.27
Math Technical Vocabulary (17)	3.54 (3.21)	4.47 (3.08)	0.32
Math and language terms (7)	3.00 (1.92)	3.89 (1.82)	0.12
Symbol reading (12)	5.04 (3.98)	6.26 (4.05)	0.31
Synonyms (8)	2.39 (2.70)	2.32 (1.92)	0.92

N=47 (28 Boys; 19 Girls); $p>0.05$

Correlational analysis

The raw scores obtained in the Test of Mathematics Language (TML), Math Vocabulary Reading (MVR) test, and Arithmetic Diagnostic Test (ADT) were analyzed to check for correlation among language,

reading and mathematics for the entire group as well as for boys and girls separately. Table 6 shows high correlation among the three tests suggesting interrelationship among the skills necessary to perform on all the three tests.

Table 6
Correlation among TML, MVR, and ADT

Test pairs	Correlation	Significance
TML-MVR	0.88	0.00
MVR-ADT	0.78	0.00
TML-ADT	0.88	0.00

* df = 46; P<0.05

The data was also analyzed qualitatively to examine the pattern of errors on items of MVR, TML and ADT. It was observed that the errors were seen on all the domains under study-prerequisite concept, math reading vocabulary, math and language terms. The errors were often related to spatial terms such as short vs. long (3%), up vs. down (4%), right vs. left (6%), More vs. less (7%), first vs. last (8%), before vs. after (16%), , horizontal vs. vertical (16%). In addition, when there were common terms used in both general language as well as in math, the percentage of errors was observed to be more than the terms indicating spatial relationship. For example, percentage of errors ranged from 12 to 18 for terms such as /*hattu*/ meaning 'ten' as well as 'to climb', /*yeLu*/ meaning 'seven 'as well as 'to get up', /*aaru*/ meaning 'six' as well as 'to cool down'.

DISCUSSION

The study was conducted with the objective of understanding if there is relation between language knowledge and mathematical ability. Therefore, the study was designed to explore the relation among language, reading and mathematical abilities in Grade IV children

with Kannada as the medium of instruction. The results on correlation analysis indicated that the ability to read math vocabulary, understanding of math language and performance on arithmetic diagnostic test is highly correlated with each other. The scores of ADT, MVR and TML showed a high positive correlation. The correlation among these constructs support the view point proposed by Riccomini, et al., that students' mathematical vocabulary learning is important for their mathematical ability. While average performance was observed on prerequisite concepts and symbol decoding of TML, performance on math technical vocabulary was poor by IV Graders indicating that they are yet to align their general language skills with mathematical language skills. Qualitative analysis showed more number of errors on the basic language terms which act as prerequisite lexicon to math learning concepts (terms like above, below, latter, middle, and so on). The results emphasize the need to incorporate mathematical language teaching in the early Grades at schools. However, there was no significant gender difference in the performance in the study population.

Percentage of failure was observed to be the highest in the category of TML in which there are linguistic terms that are shared between math language and general language. Among the items that required to decode symbolic representation, majority of participants failed in greater than and lesser than item (>&<) which could be either due to poor concept of direction (left-right confusion) or confusion with size adjectives. In general, the results support our premise that language, reading & mathematics are closely related to each other and therefore, any child with mathematical learning disability should be evaluated for general language skills also and supported, if necessary during remedial education. The findings are in support of the findings from Chinn and Aschroft (1993).

The results of the preliminary study emphasize the need to pay particular attention to the linguistic features of the 'mathematical register' as

proposed by Halliday (1978) in the process of teaching math to school children in the earlier grades. Teaching prerequisite language concepts before teaching formal classroom math is essential for success in math performance by children. Therefore, language teacher as well as math teacher should make an effort to teach the dual meanings of terms that cut across general language and math language in order to facilitate math-ability. Since majority of children perform better on problem solving when it is in oral mode than in written mode, they should be encouraged to read and understand questions before solving math problems. In general, the results of the study emphasize the relationship among language, reading and mathematics supporting Beilin (1975), Lamb (1980) among others. The results indicate that an adequate foundation in language skills along with the necessary thrust given to build up mathematical language in the early Grades is necessary to develop adequate ability in mathematics in young children.

Acknowledgments

The authors wish to acknowledge the Director, All India Institute of Speech and Hearing, Manasagangothri, Mysuru for supporting the study by extending grants (Rs. One lakh Sixty Thousand only) from the AIISH Research Fund (Ref. No. SH/ARF/Sp.Sc-6/SP/01-01-2003 to 30-12-2003); School authorities and children for their cooperation; Statistician for timely help.

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How to Reach IPS
Gwalior is connected by Air, Rail and Road. Transport facility will be made available in the morning of 22 November at Gwalior Railway station. One may also avail three/ four wheelers, which are easily available. College

No Registration Fee for Presentation of Papers: (Papers can be presented only if, the abstracts have been accepted by 31st October).

Accommodation and Food
Limited seats (on twin sharing) in college hostel will be available on first come first serve basis@Rs.350/ per head per day including food. Budget hotels are available. Reasonable meal will be available in college canteen on payment basis.
Important information
Abstract to be sent by e-mail to:
conference@ipsresearchgwalior.org
with a copy to
aiaer1987@gmail.com
Last Date for Submission of Full Papers: October **30,2018**
Delegates whose abstracts have been accepted can send their full paper in the prescribed format: Times New Roman, Font: -12, double space and MS-Word. Papers should be prepared as per A1AER iu-text citations and reference styles suggested in Manuscript submission Guidelines of JAIAER available at www.aiaer.net.
Researchers from India to send 3 copies of the paper by registered post to Principal, Institute of Professional Studies, Shivpuri Link: Road, RO: IPS College, Gwalior- 474001. Madhva Pradesh.
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They/are also requested to carry **3** copies of their papers to hand over to the chairperson of the session in the conference.

In case of A1AER, Conference papers presented shall be evaluated, and one paper each of researchers under 40 years of age, from East, North, South and West zones shall be awarded. There shall be also an award for school teachers.

AlAER Paper Writing Workshop on 21st November 2018 between 10AM *&* 4.00PM

There is no fee for participation in the workshop. The Workshop is open to participants; who register themselves by sending a mail by 31st October to:

Aiaer1987@gmail.com

Participant will receive copy of reading material by e-mail and s/he has to bring with him/her a print out of this material and has to intimate his/ her queries, if any by 10th November. One can also send his/ her paper for review at the workshop.

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