Available online at www.journalijmrr.com

INTERNATIONAL JOURNAL OF MODERN RESEARCH AND REVIEWS

International Journal of Modern Research and Reviews

ISSN: 2347-8314

Volume 2, Issue 2, pp 112-115 February,2014

NEUROCOGNITION - A NEW PARADIGM ON TEACHING COMPETENCY IN PRE SERVICE GRADUATE TEACHERS

***N. Sasikumar, M.Parimala Fathima and S.Mohan**

Center for Research in Education, Thava Thiru Kundrakudi Adigalar College Campus,Kundrakudi, Sivagangai District - 630 206. Tamil Nadu, South India.

Article History: *Received 2nd Feb,2014, Accepted 15 th Feb,2014,Published 28th Feb,2014*

ABSTRACT

This study is an attempt to discuss the impact of neurocognitve intervention approach on teaching competency in pre-service graduate teachers. The teacher plays an vital role in the educational process. Effective teaching depends upon the evolution of innovative strategies and also the methodology of teaching. As we gain a more scientifically based understanding about today's novel brain and how it learns, we must rethink about what we do in classroom and school. Neuro scientists are mapping the pathways between body and brain, providing tangible evidence of the benefits of hands-on, experimental learning. Neurocognitive process includes a number of human functions through neuronal networks. Brain cells communicating with each other through on electrochemical process. Neurocognition includes perceiving, recognizing, conceiving, judging and reasoning processes. The neurocognitive approach is based upon certain irrefutable facts concerning brain functions, which are applied to the intervention approach of student teachers professional developmental difficulties. The teachers must develop the competencies like content competency, contextual competency, communication competency, classroom management and evaluation competency. In this paper, we discuss how the brain and its functions are helpful to the teachers in effective and successful teaching.

Keywords: Neurocognition, Teaching Competency, electrochemical process and professional developmental

1.INTRODUCTION

"If the destiny of a nation is being shaped in her classroom, then the real destiny maker is the teacher"- Dr. Kothari.
Education is an integral part of every human being. It moulds him to be a good citizen, who is really an asset of the country. "The wealth of a nation depends on the education of its citizens". Teachers have a noble role in imparting knowledge to the innumerable members in a society. The teacher plays an important role in the educational process. On the caliber of the teacher depends the success with which new methods are employed and adopted. Teacher education is concerned with equipping the future teachers. The term "teacher education" is more comprehensive and has deeper implications. It includes theoretical instruction and in practice of teaching in order to develop the skills needed for teaching effectively. Teaching is a delightful experience when focus is given on activities that student's brain enjoys doing and does well, such as exploring concepts, creating metaphors, estimating and predicting, co-operating on group tasks, and discussion oral or ethical issues. Conversely, teaching loses much of its luster when students are forced to do things which their brains do not enjoy doing and do poor. For example, activities such as reading text books, compress content, writing and rewriting reports, completing repetitive worksheets, and memorizing facts that they consider irrelevant. Now, innumerable and neuro scientific facts are available which dramatically increases our understanding of the brain. Active brain imaging techniques give us windows through which we can view the brain in action. Sophisticated physiological methods, undreamt of, a decade ago, allow us to watch the reaction of single neuron as learners react to different kinds of stimuli.

***Corresponding author:** N. Sasikumar,* Center for Research in Education, Thava Thiru Kundrakudi Adigalar College Campus, Kundrakudi, Sivagangai District - 630 206. Tamil Nadu

Conceptual Understanding of Neurocognition

Neurocognitive process includes a number of human functions through neuronal networks. Brain cells communicate with each other through on electrochemical process. Neurocognition includes perceiving, recognizing, conceiving, judging and reasoning processes. To describe cognitive functions closely linked to the function of particular areas, neural pathways, or cortical networks in the brain. Neurons make up the core components of the brain, and specialise in transmitting messages via electrochemical impulses. Therefore, their understanding is closely linked to the practice of neuropsychology and cognitive neuroscience, two disciplines that broadly seek to understand how the structure and function of the brain relates to thought and behaviour. Having to do with the ability to think and reason. This includes the ability to concentrate, remember things, process information, learn, speak, and understand. Any form of cognition that is associated with the functioning of one or more specific areas of the brain.

Neural pathways, or cortical networks in the brain substrate layers of neurological matrix at the cellular molecular level.

Therefore, their understanding is closely linked to the practice of neuropsychology and cognitive neuroscience, two disciplines that broadly seek to understand how the structure and function of the brain relates to perception defragmentation of concepts, memory embed, association and recall both in the thought process and behaviour (Dolors Girbau,2007).

Nuerocognitive process includes a number of human functions through neuronal network, such as Neuronal Representation, Registration, Retrieval– STM, Frontal Cortex Content evaluation, amygdala emotional evaluation, Neocortex sensory association, thalamus neuronal network communication and sensory stimuli crude sensation **(**Stephen M. Stahl2006). Every time we think, learn or communicate, a neuron in our brain sends a nerve impulse down its axon. The axon of one brain cell make multiple thousands of connection with many thousand other brain cells. The point where one brain cell connects to another is called a synapse. When the nerve impulse (electromagnetic bio-chemical message) surges down the axon, it is fired across the synaptic gap via a chemical messenger called a neurotransmitter into the dendrite of the receiving brain cell. The nerve impulse then travels along the axon of this brain cell, across the synaptic gap to another brain cell and so on. When a neuron activates 'fires' another in this way, it's like a switch being turned on. Neurons fire like a line of falling dominoes. This activity is the process that creates the intricate pathway of thought, also called memory traces or neural pathway. Neuron can either 'excite' other neurons to make them function or they can 'inhibit' other neurons so they don't become active. Therefore there are different types of neurotransmitters that either excite or inhibit other neurons. Neurotransmitters are found in the food we eat. That is why, it is important to eat the right of brain foods in order to improve the effectiveness and efficiency of our mental process(Carl Pacifico, 2004). The brain takes in information from the sensory environment, through the eyes, ears, nose, mouth and skin. Specific areas are responsible for processing this information and then re-routing it to the appropriate part of the cortex for further attention, evaluation and action. When the brain is working as it should, then all of this is achieved with the maximum efficiency,

Neurocognitive Process

Neuro Cognitive Processing is an innovative approach to engage in passive cognitive activities such as watching a video while undergoing Neurocognitive Processing is a therapeutic approach that combines neurocognition with active mental stimulation or cognitive rehabilitation training. Neurocognitive Processing to simultaneously treat both systems resulting in a more attentive, focused mind. Pre-existing neuro pathways are strengthened through the neurocognitve approach while the cognitive rehabilitation programme is improving attention, processing speed, memory, hand-eye coordination, visual discrimination, executive function, visual memory, auditory discrimination, and auditory comprehension.

The Neurocognitive processes involved in the encoding, consolidation, and retrieval of true and false memories. Perception and memory are imperfect reconstructions of reality. These reconstructions are prone to be influenced by several factors, which may result in false memories. A false memory is the recollection of an event, or details of an episode, that did not actually occur. Memory formation comprises at least three different sub-processes: encoding, consolidation and the retrieval of the learned material. All of these sub-processes are vulnerable for specific errors and consequently may result in false memories. Whereas, processes like imagery, self-referential encoding or spreading activation can lead to the formation of false memories at encoding, semantic generalization during sleep and updating processes due to misleading post event information, in particular, are relevant at the consolidation stage. Finally at the retrieval stage, monitoring processes, which are assumed to be essential to reject false memories, are of specific importance. Different neuro-cognitive processes have been linked to the formation of true and false memories. Most consistently the medial temporal lobe and the medial and lateral prefrontal cortex have been reported with regard to the formation of true and false memories. Despite the fact that all phases entailing memory formation, consolidation of stored information and retrieval processes, are relevant for the forming of false memories, most studies focused on either memory encoding or retrieval.

Neurocognitive Training or practices

Neuro-cognitive training is an advanced method to train the brain to perform cognitive tasks that require attention, focus, concentration and memory, both short-term and long-term. It also addresses difficulties with executive functions such as organization, planning, prioritizing, time management, behaviour/emotional control and more. Neuro-cognitive training is required when a person is born with a condition that impairs his or her ability to concentrate, remember, and process information adequately.

Neuro-cognitive training is a comprehensive solution that does not cover up the symptoms but goes to the core of the problem, which is the neuro-cognitive foundation of the brain that enables proper processing of information at all levels. During the training process, the brain learns how to focus, concentrate, pay attention, and not only when things are interesting and exciting, but also when they are not, as long as the person needs to pay attention and concentrate on the topic. The cognitive processes are based on a number of core cognitive skills, which when developed and enhanced can dramatically improve one's ability to process information effectively.

Competency Based Teacher Education

The appeal of Competency- Based Teacher Education is in its emphasis on pragmatism in determining the content of Teacher Education Programmes, its potential for improvement through preparing a teacher. The basic Concepts are simple and straight forward. Programme requirements are derived from and based on the practice of effective teacher.

In Competency-Based Teacher Education greater emphasis is placed on performance-based and consequence- based objectives. What teachers know about teaching seems less important than their ability to teach and to bring about changes in their pupils. The fourth type of competency is affective. The affective competencies, which define expected attitudes and values, tend to resist Specificity and are more difficult to assess than the first three types (the prospective teacher values the contribution of all Students in a class discussion). They are typically embedded in other

Competency Statement. The fifth type, exploratory competencies do not fit well with the other four types of the competencies. Competency Based on Teacher Education Classification system, activities that promise significant learning's are Specified. Competency Based Teacher Education Programmes do not depend on exploratory Competencies, but they are employed on experimental basis. However, specific outcomes are yet to be explained.

Conceptual understanding of teaching competency

Teaching Competency is the competency of the teacher and their planning and preparation of lessons for teaching, class room management, knowledge of subject, interpersonal relationship, attitude towards the children, usage of teaching aids and time management when their teaching learning. "The Possessions of the teacher, his knowledge, skills, attitude, personality Configuration, and the like are referred to as competencies; they lend the character dimension to teaching". (Haskew, 1956).

"The competence of teacher is defined as the average success of all his behaviours in achieveing their intended effects". (Medley Mitzel, 1963). "A Competent teacher is one who: (i) has the skill of accurate perception of the classroom situation and the changes that occur within the classroom". (ii) is aware of the teacher's role which are appropriate to different situation and (iii) Possesses the personality skill, which allows him to adapt to changing situations. (Hoyle, 1969). (Barbara and Field 1994), defined competencies as "the types of skills, knowledge and attitudes that will form the basis of effective professional practice."

Thus the term 'Competence' can be understood as "quality or state of having and demonstrating skills, knowledge, attitudes and aptitudes while executing a task", and the 'teaching competency' can be conceived as "a professional ability of teachers to meet the set standards of efficiency in terms of knowledge, skill and attitudes in teaching learning process."

Competency means the right way of doing things. In teaching the competency means the right way of convening the units of knowledge application and skills to the students and the knowledge of contents. Methods and communication. Teacher education is the research based understanding of teacher competencies like contextual, conceptual, content, transactional, evaluative management competencies. A teaching competency can be divided into several components (Johnson, Charles E. 1974)

Teaching Competency and Neurocognition

The teacher competence includes a thorough knowledge of the content. A teacher competence mainly includes the strategies, understanding of student psychology and the process of thinking. With regard to the former, plenty of resource material is available. But, the latter has been a continuous experimentation throughout the world. Cognitive Psychology contributes substantially in enhancing teaching competence. In recent times, cognitive neuroscience researches have demanded the teaching competence to be redefined to meet the challenges. Naturally, the learning process depends on the effective functioning of the brain.

Competency means the right way of conveying units of knowledge, application and skills to students (Adrienne Kozan Naume 2008). The right way includes knowledge of content as well as the process, methods and means of conveying them in an interesting way. In other words, it means a desired quality of job performance (Sutopo 2010). The training for competency has always been training for creating abilities or qualities that are placed in an actual job situation or context. A teacher competence mainly includes the strategies, understanding of students psychology and the process of thinking. In recent times, cognitive neuroscience researches have demanded the teaching competence to be redefined to meet the challenges.

The neurocgnitive strategies try to do is to manipulate the sensory environment to which the student teacher is exposed in order to encourage the regions of the brain, which are responsible for processing the sensory stimuli to re-tune and to process information more normally. We understand that before we can focus on what we need to learn, and what we need to help us repair our ability to learn (Parimala.M, 2009). The neurocognitive intervention strategies can bring about the student teachers competencies and skills.

2. DISCUSSION

Teachers have a big hand in imparting knowledge to the innumerable members in a society. On the caliber of the teacher depends the success with which new methods are employed and adopted. Teacher education is concerned with equipping the future teachers. It includes theoretical instruction and practice teaching in order to develop the skills needed for teaching effectively. The teacher competence includes thorough knowledge of the content. The right way includes knowledge of content as well as the process, methods and means of conveying them in an interesting way. A teacher competence mainly includes the strategies, understanding of students psychology and the process of thinking. In recent times, cognitive neuroscience researches have demanded the teaching competence to be redefined to meet the challenges. As far as teaching learning process is concerned, the functioning of the brain facilitates information processing, restoration and retrieval. The teachers should be fully aware of all the brain functions to make their effective teaching. Neurocognitive process includes a number of human functions through neuronal networks. The neurocognitive approach is based upon certain irrefutable facts concerning brain function, which are applied to the intervention strategies of student teacher's professional developmental difficulties.

Modern trends in teacher education and neurocognition

The most important task of education for the future is to improve the professional competence of the teachers. It seeks to provide professionally by educated entrants to the profession on adequate numbers. It aims at improving the quality of entrants for the profession to satisfy society's' needs. In the field of education, quantity should also be increased without sacrificing quality.

Professional education should focus on an individual who is in practice and seeks to enlighten his mental, neural and emotional capacities, he/she should have a sound philosophy of education, knowledge of an adequate functioning of psychology along with a dynamic sociological perspective.

Only such teachers will be able to relate theoretical insight to practice and to improve teacher preparation (B.Ed. course) programme. They will be effective practitioners in their profession in adequate numbers. Teacher education seeks to develop such competencies in the prospective teachers, will make them competent teachers. It intends to increase the ability of the teacher to deal with a range of individual differences. Teachers' can facilitate a life time of successful learning by equipping students with a repertoire of strategies and tools for learning. The teacher plays an important role in the educational process. Effective teaching depends upon the evolution of

innovative strategies and also the methodology of teaching. As we gain a more scientifically based understanding about today's novel brain and how it learns, we must rethink about what we do in classroom and school. Neuro scientists are mapping the pathways between body and brain, providing tangible evidence of the benefits of hands-on, experimental learning. Neurocognitive process includes a number of human functions through neuronal networks. The present study is undertaken since the teaching competency is dependent on neurocognitive intervention strategies.

Need for Neurocognition in Pre-service Teacher Education

Teacher plays a vital role in moulding the minds of the students in classroom activities. Skilled and experienced teachers can do this by their experience. We must remember that the brains biology influences a person is exposed to cuddling or abuse, talking or silence, mentoring or scolding, support or ridicule-alter the brains network of neural connections.

A person who is considered as an efficient teacher by her/his students is not necessarily judged in the same way by her/his principal or her/his colleagues. The students are the best judges. If a teacher gets the expected output from the students as a result of his/her teaching he/she can be sure of his/her professional ethics.

The traditional methods of teaching have failed to generate the required behavioural outcomes, abilities and skills needed to facilitate the learning of curricular subjects. Knowledge of the recent development will help the teacher in making his/her teaching more effective and increase his/her efficiency as classroom functionary. Such a background will solve classroom problems. This will also enable him/his to organize teaching activities and select instructional design and teaching models and innovative appropriate strategies and techniques.

Neural tuning and Emotional integration to overcome their inefficiency and this will be definitely help them to take their roles confidently in enhancing their teaching competency in the classroom situation. Hence, there is an urgent need to steer our efforts towards the implementation of neurocognition to enhance teaching competency at all levels of Teacher Education.

Outcome of the neurocognitive intervention approach

1. Visual enrichment

1. Strengthening and stimulating neural pathways evidenced by improved information processing speed and accuracy, impacting tasks such as the reading act
2. Concentration and mental focus
3. Extension of working memory and delayed memory recall
4. Improved Visual and auditory spans of attention
5. Improved Spatial thinking and problem solving
6. Improved Sequential thinking and problem solving
7. Improved Logical thinking and problem solving
8. Improved reading efficiency (visual span, tracking and mental processing of words in the reading act)
9. Improved Coding and decoding (processing symbolic information) problem solving
10. Higher mental processing speed
11. Greater mental attention to detail
12. Building personal confidence in being able to learn

2. Auditory enrichment

1. Strengthening and stimulating neural pathways evident by improved mental speed and accuracy in auditory tasks.
2. Concentration and mental focus.
3. Extension of working memory and delayed memory recall.
4. Auditory spans of attention.
5. Sequential thinking and problem solving.
6. Mental processing speed.
7. Mental attention to auditory detail.
8. Personal confidence in auditory perception and related mental capabilities.

These abilities transfer to improving teaching competency in a learning environment.

3.CONCLUSION

As far as teaching learning process is concerned, the functioning of the brain facilitates information processing, restoration and retrieval. The teachers should be fully aware of all the brain functions to make their teaching effective. Also they aware of the factors like Instructional procedure, model using the strategy, think about, start with simplified materiel, complete part of the task for the students, present material in small steps, anticipate student errors and difficult areas, provide models of expert work, suggest fix up strategies, increase students responsibility influencing in teaching competency. We suggest that, if the teacher may follow some of the following neurocognitive practice such as Affective education, Relaxation training, Cognitive restructuring, Attribution retraining, Problem solving, Contingent –reinforcement, Neural Modeling, Neural Plasticity,Neural rewiring ,Neural firing, Neural tuning and Emotional integration to overcome their inefficiency and this will be definitely help them to take their roles confidently in enhancing their teaching competency in the classroom situation. Hence, there is an urgent need to steer our efforts towards the implementation of neurocognition to enhance teaching competency at all levels of Teacher Education

.

4.REFERENCES

Adrienne Kozan Naume 2008. Science teacher competencies in a knowledged Based society.

Ankara 2006. Generic teacher competencies. Support to basic education project "teacher training component"

Dolors Girbau 2007. Neurocognitive Approach to the Study of Private Speech. The Spanish Journal of Psychology ,Vol. 10, No. 1, 41-51

Douglas J.Hacker 2001. Metacognition in Educational Theory and Practice ISBN 0-8058-2481-2, Lawrence Erlabaum Associates, Publishers, New Jersey,London.

John J. and Ratey, M.D. 2008. A Users Guide to the Brain, Vintage books, NewYork.

Nicole Fiori 2010Cognitive Neuroscience ISBN 978-81-203-4037-4, PHI Learning Private limited, New Delhi-110001

Pacifico 2004.,A Mechanism for the Human Thinking Process-A Hypothesis in Cognitive Neuropsychology. *www.drexel.edu/pacifico*

Parimala Fathima, M. 2009. Neurocogniion and learning, Today Publication Pvt.Ltd Chennai

Stephen M. Stahl 2006. Structure and Function of Neurons. Neuroscientific Basis and Practical Applications, Cambridge University Press

Sutopo 2010. Indonesian science teachers Competencies. Sutopo, Phys.Dept. SUM