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### Dimensions of Research in Teaching: A Critical Review

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#### ABSTRACT

Since the inception of knowledge research has been playing a pivotal role in the discovery of new vistas of knowledge. Therefore, the teachers, researchers, and theorists staunchly believe that educational research and teaching is essentially interlinked. Research is systematic and within a broad framework follows the steps known as scientific method. However, across different types of studies there is extensive flexibility in how the steps are implemented. a research should be systematic , empirical valid and reliable in its nature. Various kinds of research are used by researchers by the researchers in accordance to their needs of specific research design. The review of the literature revealed that research has played an important role in the development of theory, learning theories and curriculum. The use of these theories and curriculum helped the theorists to design teaching models which are now used by the teachers to impart knowledge effectively. The historical research method was used for this study because this study aimed at having a review of literature related to research-based teaching learning process. The study has revealed that effective teaching is possible only when teachers possess ample knowledge of philosophy, learning theories, curriculum and strategies of teaching. Having been acquainted with these fundamentals of research and knowledge a teacher would be professional and effective teacher who would disseminate knowledge in a professional manner.

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#### Introduction

Since the beginning of the formalized education, research has been used to improve education and to determine in a wide range of situations. Through various research methods, teachers hope to obtain reliable and accurate information about important issue and problems that face the educational community.

Knowledge of research is an essential as well as integral component of professional preparation for attaining skills and competence for all teachers. A must be knowledgeable about multifarious approaches of research to promote creative, innovative and sound solutions to learning and teaching issues.

Weirsmas and Jurs (2009) explain that research has become such a prevailing phenomenon of our civilization that all of us are influenced by it. He explains that the situation of an average elementary or high school teacher is not different than a graduate who face the issues in learning. Therefore, is carried out for the purpose of explaining and predicting phenomenon and particularly in educational research those that impact teaching and learning as well as operations of the school. There is an inherent assumption that educational research, by providing better understanding of the educational process, will lead to the improvement of educational practices.

MacGee and Fraser (2000), defines that professional practices refers to the ideas and practices that mark the teachers out as professional decision makers. These teachers inform their practice by a critical consideration of theory and knowledge. They are what Holly called “extended professionals.

Extended professionals continually make efforts to improve their practices by using the knowledge come forth owing to the research carried out in the field of teaching. In order to carry out

professional practice, teachers need to acquire a great deal of knowledge and many skills. Professional knowledge is embedded in practice and cannot be separated from it. Teachers also learn ‘knowing-in-action’, but they also need to reflect upon the many complex situations they face.

A professional teacher must be acquainted with research approaches and methodologies because decision making about teaching and curriculum in the schools is based on experience, expert opinion and research results. Education is a complex process. Both teachers and learners find themselves in fluctuating and complex social interactions.

Berliner (2002) explains that there is several numbers of interactions operating simultaneous, such as teaching behavior interacting with students features (e.g motivation). Education is essentially context specific, limiting the generalize ability of educational research findings. Correspondingly educational research is very demanding and complex. However, broad spectrum of research activities uses various research methods, ranging from relatively simple to complex combinations of procedures. A teacher is always researcher as with organized and concentrated study, he is able to master necessary research methods to apply to improve teaching strategies for making the teaching learning process more effective.

Teaching and learning process are very complex processes that is influenced by various factors including learner’s attitude, abilities, learning styles, teacher’s belief, knowledge, abilities and learning context all have significant effects on what learners learn (Killen, 2003).

Another historical change in the way we look at teaching is that now we emphasize that a teacher’s main role is to facilitate

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the learning. It seems imperative to describe that teaching is either teacher-centered or learner-centered. Killen (2003) describes that teacher-centered approach (sometimes referred as direct instruction) is deductive teaching or expository teaching. A lecture is its important example. Learner-centered approach (sometimes referred to as discovery learning, inductive learning or inquiry learning) place a much stronger emphasis on the role of learners in the learning process.

The two approaches differ in several ways. In either approach teacher has a pivotal role as a researcher, planner and facilitator of learning. He has to decide what outcomes learners are to achieve and how he has to facilitate the learners to learn. Therefore, the literature on teaching and research reveal that both have approaches are of utmost importance and they can be utilized separately or combined.

The best we can conclude at this stage is that effective instruction needs active involvement of learners and an emphasis on academic achievement that is possible only by carrying out research.

### **Review of Literature**

#### **Educational Research- Definition**

According to Weirisma and Jurs (2009) educational research is systematic and within a broad framework follows the steps known as scientific method. However, across different types of studies there is extensive flexibility in how the steps are implemented.

#### **The Nature of Educational Research**

Weirisma and Jurs (2009), describe that research essentially is an activity, or process, and even though research process are varied and several, certain general characteristics help define its nature. The few general characteristics of educational research are, a) research is empirical, b) research should be systematic, c) research should be valid, d) research should be reliable, e) research can take a variety of forms. Empiricism, they further elaborate, is the concept that all knowledge is derived from sense experience that comes from observation and experimentation. Empirical knowledge is data based. This type of knowledge would come purely from logical conclusions or from word authorities.

McMillan and Schumacher (1997), define research as “a systematic process of collecting and analyzing information for some purposes”.

Kerlinger and Lee (2000), define scientific research as “systematic, controlled, empirical, amoral, public and critical investigation of natural phenomena guided by theory and hypothesis about presumed relations among such phenomena”. Therefore, educational research is recommended to be systematic. This objective can be achieved by using scientific inquiry also known as scientific method.

Fraenkel and Wallen (2003) elaborate scientific method essentially involves the testing of ideas in the public arena. This process consists of a series of sequential steps. Regardless of the form of research or the ends to which it is directed, research should be valid. They also explain the term validity which refers to the appropriateness, correctness, meaningfulness and usefulness of the specific inferences researcher make based on the data collected.

Weirisma and Jurs (2009), explain that validity deals with the accurate interpretability of results (internal validity) and generalizability of the results (external validity). This is deemed necessary to explain the relevant concept of reliability as well. They explain that reliability refers to the concept of consistency

of the research and extent to which studies can be replicated. Sometimes, we distinguish between internal and external reliability. Internal reliability refers to the extent that data collection, analysis and interpretations are consistent given the same conditions. External reliability deals with the issue of whether independent or not independent researches can replicate studies in the same or similar settings.

#### **Paradigms of Educational Research**

Researchers address a variety of research questions and use a vast array of methods singly or combined. Underlying each research study is the theoretical framework, or paradigm. Weirisma and Jurs (2009), defines paradigm as “a reflection of the researcher’s view point on what constitutes valuable research”.

Mertens (2005), describes the paradigms of research as positivists, post-positivist, constructionist and transformative.

Positivist researchers use the scientific method when conducting research. Their goal is to discover the cause- and-effect relationship. Their research is considered to be value free.

Post-positivists believe that the researched relationships among variables may be influenced by values, theories and conditions that are included in the research study. Their goal is to eradicate substitute explanations for the results. They usually state in terms of than certainties.

Constructivists develop theory from data. Reality is seen as a socially constructed. Findings are considered to be context-specific as they depend on the interpretations of situations. There is also concern how the researcher recognizes that values may be influencing the research process.

Transformative researchers take the political nature and attempts to include diverse people in researcher so that we have an understanding of whether our research findings are true for all subgroups. The researchers recognize that the socially constructed reality is influenced but ethnic, gender, cultural, economic and other factors.

The choice of paradigm may depend to some extent on what is credible evidence for your primary audience.

#### **Classification of Educational Research**

There are many ways to classify educational research studies and scholars use classification systems of varying degree of complexity. MacMillan (2003), describes that generally, educational research is classified into three, a) goal or purpose based research, including Basic and Applied Research. This type of research is usually is conducted by teachers and administrators for solving a specific problem, b) qualitative or quantitative continuum that represents two distinct orientations to phenomenon studied. Qualitative research stresses a phenomena of logical model in which multiple realities are rooted in subject perceptions, while in Quantitative research, a major distinction is made between non-experimental and experimental designs... it usually means that the study can only describe something or uncover relationship between two or more factors, c) General methods used in educational research include Experimental, Quasi-experimental, Historical, Ethnographic and descriptive researches.

#### **Role of Theory**

Kerlinger and Lee (2000), defines theory as “ a set of interrelated constructs (concepts) definitions and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting a phenomena”.

McMillan (2003), defines theory as a “set of propositions that explains the relationships among observed phenomena.

Weirsmas and Jurs (2009), define theory as a generalization or series of generalizations by which we attempt to explain some phenomena in a systematic manner.

Basically theory helps to provide a frame work by serving as a point of departure for the pursuit of research problem. In educational research theory serves a synthesizing function, combining ideas and individual bits of information into a set of concepts that provides for a deeper understanding, broader meaning and wider applicability. Theory attaches meaning to facts and places them in proper perspective.

#### **The Activities of Research Process**

The systematic process of research leads to general activities involved in conducting a research study. These activities are identification of problem, data collection, and analysis, summarizing results and drawing conclusions. Researchers in the field of teaching have been using different approaches and research designs in accordance with their requirements of research.

#### **Dimensions of Research on Teaching**

The research in the field of education has brought several theories of learning which are used by the teachers and curriculum developers to enable the teachers and learner for benefitting from the knowledge being imparted. A brief review of the important learning theories is essentially of great significance.

#### **Five Learning Theories**

##### **Behaviourist Learning Theory**

Behaviourism can be said to have been born when the Harvard psychologist Burrhus Frederic Skinner (1904-1990) in 1938 his classic text the *Behaviour of Organisms*, which introduced the principles of what he called ‘operant conditioning’ and ‘learning through reinforcement’. However, behaviorism did not really achieve educational recognition until a conference until in Indiana 1946 (Simmons, 1996). Ivan Pavlov, who won his Nobel Prize in 1904, had always considered that the body is like a machine, with its own regulatory mechanism, and he regarded animals as experimental substitutes for human beings (Sparks, 1982).

Fredrick Taylor’s influential book *Principles of Scientific Management* (1911), with its narrow physiological focus on workplace efficiency and ‘man-as-machine’ (Hoy & Miskel, 1978, p.4;) was later seen as a justification for those behaviorist educators who would employ stopwatches to research teacher ‘wait time’ or pupil ‘on task’ efficiency (McGee & Fraser, 2005).

The ‘Skinner box’ was at the heart of behaviorism. In contrast with Pavlov’s approach Skinner’s method involved isolating and describing behavior which operated upon the environment. Skinner’s box could provide a focus of learned behavior. However, increasingly, behaviorism had vocal critics. In 1957 Noam Chomsky’s *Syntactic Structures* proposed that our liability to communicate through language is rooted in brain’s basic wiring. This opposed Skinner’s view, which accounted for language in terms of simple stimuli, reinforcement by rewarding feedback (Duit & Treagust, 1998). Also, since the mid 1980s, so called New-Right economic policies in education (Snook, 1997) have stimulated what has labeled a ‘neo-behaviourist’ approach to teaching, with an emphasis on achievement objectives and learning outcomes.

In the classroom many of strategies we adopt, and the terms we use, have their origins firmly in behaviourist learning theory:

these can include positive and negative reinforcement, assertive discipline, behavior modification programmes, logical consequences, punishment, wait time, rewards, management, control, and so on.

##### **Developmental Learning Theory**

This theory is basically the story of Swiss psychologist Jean Piaget’s (1896-1980) intellectual pathway from the 1920s to the 1950s. Piaget was influenced by many of the most important thinkers in Europe: psychologists Carl Jung, Sigmund Freud Alfred Binet, and physicist Albert Einstein. His unique combination of biological thought, interview methods adopted from clinical psychology, and interest in philosopher Emmanuel Kant’s ideas about knowledge culminated in his ‘stage theory’ in *The Growth of Logical Thinking* 1958.

The stage theory holds that every one’s cognitive development passes through four sequential, age related stages including a) *Sensorimotor* (from birth to about two years) where infants think exclusively through their senses and their motor abilities: b) *pre-operational* stage (from about two to six years) where children use symbolic thinking including language, but often egocentrically: c) *concrete operational* stage (from about seven to eleven years) where children think logically, but only about their concrete features, not abstractions; and d) *formal operational* stage (from about 12 onwards, where young people think hypothetically and abstractly, solve problem entirely. (McGee & Fraser, 2005).

American educator Jerome Bruner’s the *Process of Education* 1960 became a source of launching stage theory in America. Bruner emerged as the founder of scholarly structuralism in USA. His excitement was obvious: ‘We begin with the hypothesis that any subject can be taught effectively in some intellectually honest form to any child at any stage of development’ (Bruner, 1960, p.33).

These possibilities were to capture teachers, especially in the USA, for the next twenty years (McGee & Fraser, 2005). However, by the late 1970s it was found that classrooms breakthroughs had not occurred. Donaldson (1978), explored that context could be more important than child’s developmental stage was raised. Driver (1978), questioned the existence of universal, context-independent stages. Actually, Piaget did not feel threatened because his personal focus was always on the underlying structure of cognition and development, not learning.

##### **Humanistic Learning Theory**

Carl Rogers (1902-1987)’s two books *Client-Centered Therapy-Its Current Practice, Implications and Theory* (1951) and *Freedom to Learn* (1969) a shift in focus from one-to one counseling to a broader, school-based concern with a personal growth which includes emotional growth epitomized in these two books. The humanist philosophy, which precipitated a spectacular debate between Skinner and Rogers in schools in 1956 was emerging as a theory of learning in schools by the mid 1960s.

Abraham Maslow (1908-1970) suggested how teachers can prioritize the forms of care they give. His ‘hierarchy of needs’ is a sequence by which children’s full potential for learning can be developed, by first attending their deficiency needs such as food, shelter and clothing and then concentrating on their psychological needs i.e. love and self-esteem. This will help the child to achieve ‘self-actualization’: becoming aware of, and confident in, knowing and teach (McGee & Fraser, 2005).

### Social constructivist Theory

Constructivism is probably as old as the teaching methods of Socrates (Hawkins,1992),but the origin of the constructivist approach can be traced in the twentieth -century Piaget's book *The Construction of Reality in Children (1937)* dealt with an issue entirely different from the developmental stage theory. He explained how people adapted their thinking to include new ideas. As new experiences provide additional information. ( Mcgee & Fraser, 2005).

Ausubel's *Educational Psychology: A Cognitive View (1968)* pushed Piaget's notion of adaptation in new "constructivist" directions. Both Piagetians and Constructivists had emphasized the importance of prior knowledge, which they saw as relatively well structured and stable. The Ausubel's influence converted the emphasis from concerns with children's underlying, universal operational thinking to structure.

However, the critics of constructivism have challenged its assumptions about Western norms of rationality, its perceived relativism, and its failure to portray the fluidity of learners' cognitive processing and the lack of stability of their ideas.

### En-activist Learning Theory

The question of fluidity of mind and its cognitive structures touches on the point of departure between constructivism and a new idea, en-activist learning theory , which has been emerging since about 1990, especially in Canada.

En-activist actually reject the whole constructivist assumption of world-personal dualism. From this perspective have an ecological idea of learning is experiential, requiring people to act on their world. Learning is evolutionary, having a biological, social and historical basis, and involves a continual process of reinterpretation. Learning is complex (no linear), co-emergent. Occasioned (not caused by teaching) and situated. (Biddulph and Carr, 1999).

### Curriculum

Skillful teachers who have the knowledge of both curriculum and the needs of their students have the flexibility of their to negotiate curriculum with students to maximize participation, engagement and depth of learning(Bean, 1997., Boomer., et al,1992). Central to the professional tasks of a teacher is the responsibility for the curriculum because it is significant for teachers to have an understanding of the term.

Curriculum originally a Latin word that means 'course'. A simple definition of curriculum is a course of study. However, the different authors have offered different definitions of curriculum. To Taba (1962), "a Curriculum is plan for learning". This is used by teachers for imparting learning to pupils.

Tanner and Tanner (1980), define curriculum as a "construction of knowledge and experience, systematically developed under the auspices of the school...to enable the learner to increase his or her control of knowledge and experience".

Curriculum is taken to include educational experiences that are planned to take place in a classroom as well as the practical application of the planning in the classroom.

### Models of Teaching and Learning

According to Dewey (1916), the core of the teaching process is the arrangement of environment within which the students the students can interact and study how to learn. A model of teaching is a description of a learning environment. (Joyce, et al, 2000).

The social model of teaching are construct to take the advantage of this phenomena by building learning communities, Group investigation is the direct route to development of the community of learners. Dewey (1916), developed the idea – extended and refined by many teachers and theorists and Herbart Thelen (1960) shaped its concrete definition that education in democratic society should teach the democratic process directly. Role playing model of teaching helps students to under social behaviours, their role in social interactions and ways of solving problems, the information-processing family of models comprises inductive thinking (developed by Taba) concept attainment (Jerome Bruner) Menomics( Micheal Pressly) advance organizers( Joseph Schwab) inquiry training (Richard Schuman) syntactics (Bill Gorden), while development adaptation and instructional design models consists of conceptual system theory (David Hunt, Harvey, and Harry Schroder) cognitive development (Jean Piaget) conditions of Learning (Robert Gagne), personal models were designed as non-directive teaching (Carl Roger),enhancing self-esteem (Maslow, while behavioural models of teaching are enlisted under mastery of learning (Benjamin Bloom), Direct instructions(Tom Good, Jere Brophy, Carl Gereiten, Ziggy, Englmen Wes Becker) Simulation (Carl Smith , Mary Smith) social learning (Bandura, Carl Thoreson, Wes Becker), and Programmed Scheduled or Task-performance reinforcement( B.F Skinner). (Joyce, et al 2000). Placement of teaching models in a programme of study is important in teaching – learning process. The knowledge of the teaching models helps teacher to use them in a desired environment to achieve the objectives.

### Research Methodology

Historical research is a systematic process of searching for the facts and then using the information to desirable, analyze, and interpret the past.(Weirsmas and Jurs, 2009). Historical research may have a variety of foci. It helps to focus on issues, movements, and concepts in education. As the researcher use the documents, interpretation again takes place. Context and interpretation are essential elements of historical research.

Therefore, history requires the importance of understanding the full context of events- the deeper causes and the long range consequence (Ellnenwood, 2007). The primary sources were used to benefit for this paper.

### Objectives

The study aimed to have a review of research – based literature related to teaching and learning process and to suggest the measure to improve teaching – learning process.

### Findings

The review of the related review explores the educational research; teaching and learning are essentially interlinked. The educational research opened the new vistas of learning that led to the innovation of new learning theories. On the other hand the theorists offered different definitions of curriculum that were based on different philosophical and psychological foundations. These theorists also designed different teaching models of teaching which are very beneficial for teaching- learning process.

### Discussions

The educational research helps the researcher and teachers to develop significant notions regarding the teaching based on research. The topic of effective teaching has been well researched and the findings from numerous studies are remarkably similar. The findings presented the need to be viewed in the light that is the individuality of the teachers versus

a set of principles creates many variations on what can be deemed effective. Effective teachers seem to have a blend of certain personal attributes and pedagogical skills (Boylan, et al., 1998., Brookfield, 1995., Cullingford, 1995., Ramsden, 1992).

The core personal qualities include knowing the students, knowing and being yourself, being compassionate and confidential, friendly and having a sense of humour. In addition, the significant pedagogical qualities include the elements such as depth of knowledge in the subject are, a passion for learning, desire to share this knowledge, a philosophy on teaching and clear learning outcomes non-confrontational behavior management (Mcgee & Fraser, 2005). These are the teachers who taught us to live in the world, enhancing our capacity to live fully and deeply with an open mind and critical consciousness (Hooks, 1994).

Teachers face many challenges, particularly how to manage their classrooms and classes. There are some conditions that are beyond teachers' control such as the home conditions of students, curriculum policy changes, community expectations and even the way in which their school functions. However, the conditions are under the control of a teacher which help them to control the classrooms and classes. Management of the classrooms requires planning to manage time, lesson plans, use of best suited teaching strategy according to the interest of the students (Killen, 2009).

#### Conclusions

There are changes in teaching, learning and curriculum, and school and community role has also changed that laid impacts upon teachers' roles. It is likely that teachers should understand the relationship of educational research and teaching-learning process. The existing theories, approaches to curriculum as well as teaching strategies essentially help the teachers to innovate their professional practice of teaching. In order to execute their professional practices, teachers need to acquire ample knowledge and many skills. Not so long ago teaching was considered as an emerging applied science based upon laws of cause and effect. A skilled teacher can orchestrate the complex activities of classroom. Professionals are also need to be life long learner.

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