INTRODUCTION

The systematic research on mental retardation began in the middle of the 19th century with a focus on identifying, classifying and improving living conditions of the mentally retarded. This focus at the turn of this century shifted to cataloguing the strength of the retarded persons. The investigators demonstrated that the retarded persons also could learn and remember and the behaviors of retarded persons lie on a point on a continuum which is not qualitatively different from intellectually average persons. After the second world war the researchers started applying the models of psychology to the condition of mental retardation and established that every major psychological process is deficient in one way or another in mentally retarded. Detterman, (1979) referred this pervasive finding as "everything" deficit because almost all mental processes appear to be affected in the condition. Recently, the researchers have focused on integration of mentally retarded, developing community based rehabilitation services, and preparing the mentally retarded persons for independent living.

Definition of Mental Retardation:

Mental retardation is a hypothetical construct which is inferred from observation of behaviors and test performance. A large number of attempts have been made to delineate the distinguishing features of the condition. Brockett (1856) repeated Seguin’s description of an idiot as "an individual who knows nothing, can do nothing, and wishes nothing; and every idiot approaches more or less to this maximum of incapacity" (p. 78), and then recommended that idiocy be defined as the result of an infirmity of the body which prevents development of the physical, moral and intellectual processes in varying degrees.

To bring out objectivity in the definition of mental retardation, the scores on the tests of intelligence were taken into account after the development of the first test of intelligence by Binet and Simon in 1905. Terman in 1916 classified the retarded persons on the basis of the scores on the adapted version of the Binet-Simon scale. Any person who scored 79 or less was labelled as retarded and classified into any of the categories of borderline, moron, imbecile depending upon the scores on the tests. Despite criticisms the scores on intelligence tests still play a significant role in the diagnosis of mental retardation.
During first half of the present century the definitions of Tredgold and Doll were as much influential as the test score definitions. According to Tredgold (1937) amentia is “a state of incomplete mental development of such a kind and degree that the individual is incapable of adapting himself to the normal environment of his fellows in such a way as to maintain existence independently of supervision, control or external support” (p. 4). Doll (1941) considered six features to be essential for an adequate definition “(a) social incompetence, (b) due to mental subnormality, (c) what has been developmentally arrested, (d) which obtains at maturity, (e) is of constitutional origin, and (f) is essentially incurable” (p. 215). The Tredgold’s definition has been criticized for not specifying valid criteria to differentiate “retarded” from “non-retarded” and for lack of specification of “normal environment”. Three aspects of Doll’s definition viz. constitutional origin, essentially incurable, and obtains at maturity, encountered major criticisms (Sarason, 1949).

In 1957 American Association on Mental Deficiency (now, American Association on Mental Retardation) began to develop a manual on definition and classification terminology which resulted in a definition of mental retardation. The same has been revised several times since then. The latest definition published in the 9th edition of *Mental Retardation: Classification, and Systems of Support* (1992), reads as follows:

Mental retardation refers to substantial limitations in present functioning. It is characterized by significantly subaverage intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work. Mental retardation manifests before age 18.

The current definition assumes that, with appropriate support adaptive skills will often improve. It recognizes that limitations coexist with strengths which are only a part of the total picture of overall functioning. The old subcategories - mild, moderate, severe, and profound have been eliminated in favor of a new approach which categorizes needed support instead of individual.
Theories of Mental Retardation:

One of the first attempts to explain the condition was the notion of Jean Marc Gespard Itard who held the view that the mind of a new born infant was like a blank paper to be written by experiences. He advocated that mental retardation is a consequence of inappropriate or inferior sense experiences. Seguin also believed on the effect of sensations on the intellectual development and further suggested that a deficient central or peripheral nervous system might prevent the sensations to reach the brain. He, therefore, implied an involvement of organic factors in the causation of mental retardation (see Kolstoe, 1970, pp. 21-22).

For about 100 years from 1850, few attempts were made to explain the mental retardation, theoretically. Benoit (1959) proposed that mental retardation can be conceived as a deficit in intellectual functions resulting from various intrapersonal and/or extra-personal factors. The most common causative factor is a low efficiency of the central nervous system resulting in reduced capacity of perceptual and conceptual integration, which further causes difficulties in the adjustment to the environment. Zigler (1969) proposed a developmental theory of mental retardation. According to this theory mentally retarded individuals develop slowly and reach a lower asymptotic level of development than do intellectually average persons. Ellis (1963) suggested that the mental retardation is a consequence of stimulus trace deficit. In 1970 Ellis proposed a rehearsal deficit hypothesis. Zeaman and House (1963) suggested deficits in attentional processes. Belmont and Butterfield (1971) demonstrated that mental retardation might result from deficient executive processes. Detterman (1987) viewed human intelligence as a set of independent abilities organized in a complex system. He conceived mental retardation as a deficit in a few of the independent abilities which are most important in system functioning. The affected abilities, however, vary from person to person.

Much of the research on mental retardation have been based on Ellis's deficit theory. Intelligent behavior is thought to be controlled by a set of processes some of which might be deficient in mentally retarded. The goal of researches is to identify such processes (Detterman, 1987).
Bijou (1966) advocated that the condition should be labelled as developmental retardation instead of mental retardation. He argued that only the behaviors of a person both excess and deficit lead him/her to be called as retarded. He further stated that developmental retardation should be treated as objectively observable and defined stimulus-response relationship. No hypothetical mental concepts should have any scope. He stated that "a retarded individual is one who has a limited repertory of behavior shaped by events that constitute his history." (p. 2). The principles of development are the same for normal and for "deviant" individuals. Bijou proposed that the research in retardation should be carried out to identify and analyse those observable conditions that lead to the retarded behavior. These conditions then should be systematically manipulated to alter the retarded behavior. In summary he said "in our view, retarded behavior is a function of observable social, physical, and biological conditions, all with the status of independent variables". (p. 3)

Bijou's perspective is important to the study of mental retardation for two reasons: (1) he addresses the problem with a solution. If behavior (dependent variable) is a function of environmental conditions (independent variable), then the retarded behavior can be altered through systematic manipulation of antecedent and consequent events, and (2) it presumes that all behaviors irrespective of adaptive or maladaptive are acquired and maintained by the same principles of learning (Repp, 1983).

Applied Behavior Analysis:

Applied behavior analysis is the process of applying and evaluating the effects of behavioral procedures. Heward and Cooper (1987) defined applied behavior analysis as "the science in which procedures derived from the principles of behavior are systematically applied to improve socially significant behavior to a meaningful degree and to demonstrate experimentally that the procedures employed were responsible for the improvement in behavior". (p. 14)

Baer, Wolf, and Risley (1968) identified seven fundamental characteristics of applied behavior analysis; (1) applied: which means it deals with important and real world problems, (2) behavioral: which means that it focuses on things that people do, (3) analytic: which means it incorporates measurement procedures and decision making rules for deciding whether a particular procedure is effective for the individual; (4) technological: which means that it specifies the strategies adopted for
behavior change; (5) conceptually systematic: which means the procedures are derived from theories of learning, (6) it strives for developing effective procedures, or those which result in substantial changes in behavior which have practical value for the individual; and (7) it strives for generalizable effects.

Applied behavior analysis is based on the fundamental assumption that a given procedure may not be effective for a particular student. There are individual differences in the learning style and learning history. The learning needs and style of some students are so apparent that effective teaching strategies can be employed very easily. Some students on the other hand may require a careful and detailed programming of teaching procedures due to their learning or behavior problems.

Wolery, Bailey, and Sugai (1988) proposed a teaching model based on applied behavior analysis. The model involves following steps: The first step is to identify an overall goal which could be acquisition of a skill or reduction of problem behavior. The second stage is to gather the baseline on the targeted behavior. The third step is to specify a learning objective. The objective specifies precisely the skills the student is expected to perform. The conditions under which it is to be performed and the level of mastery. Fourth, an intervention program is planned and implemented that meet the needs of the students. Fifth and concurrent with the program implementation is the ongoing monitoring and evaluation of the progress. This requires repeated assessment of performance over time. Finally, regular evaluation of data is conducted to determine the progress and to decide whether or not instructional changes are in order. As a result of this evaluation the teacher may decide to continue the program as it is, to move back to an easier skill, or to modify the instructional procedure to facilitate the attainment of the original objective.

A large number of studies have demonstrated the efficacy of the principles of behavior in teaching the mentally retarded and other population. For example, meal time skill (Nelson, Cone, and Hanson, 1975); auditory and visual discrimination (Schreibman, 1975), letter discrimination task (Wolfe and Cuvo, 1978; Tawney, 1972), Sorting of bolts (Gold and Barclay, 1973), pegboard skill and self-care skill (Mosk and Bucher, 1984), complex visual discrimination (Smeets, 1990), teaching of confused letters and numbers (Bradley-Johnson et al., 1983), spontaneous verbalizations of affection (Charlop and Walsh, 1986), eating independently in fast food restaurant (Van Don Pal et al., 1981),
good posture, absence of face touching etc. (Schwartz and Hawkins, 1970), co-operative play (Redd and Birnfcrauer, 1969) greeting response (Stokes, Baer, and Jackson, 1974), walking on crutches (Horner, 1971), block tower building (Goetz and Baer, 1973), playing with toys (Haring, 1985), correct use of plurals (Guess et al., 1968) and, object naming and asking for objects (Charlop, Schreibman, and Thibodeau, 1985).

The investigation on monetary skills have already been conducted for teaching discrimination of five American coins (Wunderlich, 1972), recognition of a single U.S. coin (Mc Ivor and Mc Ginley, 1983), recognition and relative value of seven British coins (Llorente and Gaffan, 1989), recognition and naming of coins (Miller, Cuvo, and Borakove, 1977), coin equivalencies (Trace, Cuvo, and Criswell, 1977), and coin summation (Lowe and Cuvo, 1976; Borakove and Cuvo, 1976).

In the light of above, the present investigation aims at teaching coin skills-coin matching, coin recognition, and coin naming to the mentally retarded persons based on the principles of applied behavior analysis. Coin matching is defined as the ability of a subject to pick up an exemplar of a coin of the same value in response to the coin pointed out by the experimenter. Coin recognition is conceived as the ability of a subject to sort out an exemplar of a coin of specified value asked by the experimenter. Coin naming is defined as the ability of a subject to tell the value of a coin shown by the experimenter.