



Studies Conducted On Personalized System Of Instruction (PSI) In Abroad And India

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Abstract

A comprehensive review of literature from Journals and conferences was carried out; papers reviewed were predominantly based on PSI and previous education system of Abroad and India. Personalized System of Instruction (PSI), also known as the Keller Plan, is an instructional strategy developed by Fred S. Keller in the 1960s.

INTRODUCTION

An analytic study of the Research projects on various aspects of science education relating to the low achievement in science subjects and their findings leads us to understand how these factors are being ignored even though some of the remedies are suggested. It is only because even for experimenting with the known parameters, the classes required will not be available. If the experimental group is taught using a particular method, they would fall behind the class schedule which requires the teaching to be finished in a specified time period. Hence many of the researches conducted out side our own country bear its importance, as the student population in general is more or less normally distributed we can safely make use of or apply the results without any loss to our set up. Even if there exists a difference, it will be just with regard to the local conditions and a particular system of educational set up.

Researchers in India (in the field of education) too have been aware of the poor state of science education and have conducted many research studies on various aspects of science education. Some representative studies similar to the problem are mentioned below.

These researches are reviewed here one by one taking different aspects of science education.

STUDIES CONDUCTED ABROAD

Hugh, Allen Jr. (1959) determined attitudes of selected high school seniors towards science and scientists. The population was 3051 seniors at the high school. An attitude scale was developed. This scale comprised of 95 items. It was concluded that students possessed view favourable to science and scientific aim. In this study researcher found that science and technology have not only enriched the society but were essential to its full development. There was no significant difference between the science and nonscience group in their attitude towards the scientific enterprise.

Hubbard H.N. (1964) used facts about Science test to determine how students detected science and scientists. It was discovered that the experimental group in the improvement of representation did better on the total test than the matched control group.

Tetra W T (1964) conducted a study to find the effect of supplementary reading programme of selected falsehood about scientists in senior high school students. One hundred and twenty students were selected on the basis of intelligence reading score age, sex, average grade in English average, grade in Science. The two groups of students were formed. Attitude of high school seniors towards science and scientific concerns scale developed by Hugh and Allen (1959) was used. Finding of the study there was no relationship between intelligence score or average grade in Science and changes in ideas brought about by reading science falsehood . Similar result was occurred in the study of Wick and Yager (1966) and Synn and Bledsoe (1967).

Parodin (1966) determined attitudes concerning Science as school subject. The analysis of his results discovered that fourth graders had more favourable attitude towards Science than eight graders. Science was considered to be important by the students. In term of sample size the IEA research represents the most detail study even conducted in science education field.

Torshen (1969) and Kifer (1973) have demonstrated the generalized consequences of success in school to the individuals self concept. In their study what they find that many studies in which mastery learning strategies have not proven to be highly effective the most common reason for failures is that the students were not induced to correct their learning difficulties as discovered by the tests.

Kim (1971) examined the relationship between IQ and student achievement using Mastery and non mastery learning approach to teach korean students of seventh grade a unit on simple geometric figures. The important point to note from

the data is that the percentage below average IQ students who achieved the criteria when taught by mastery learning methods was less but not that much less than the proportion of students with above average IQ who reached the standard when taught by non mastery strategy. Similar result was found in the study of Austin and Gilbert (undated) Block (1970-72) Caponigri (1972) Lively (1973) and some non experimental studies. Kim (1970) and Shepler (1969).

Gandener P.L. (1974) has conducted a study on pupil personality and Teacher behaviour and attitude towards a physics course, the result of PQRS physics questionnaire research. They observed in their studies that the very senior students will tend to maintain a more favourable attitude to physics than the less senior students.

Gardner (1972) administered the Physics attitude index to grade eleven physics students of Victoria. Achievement motivated and intellectual students tend to display greater interest in physics. Evidence indicating that boys have greater interest in Science than girls similar findings was reported by Clearke (1972). Keeves (1973) Holton and Beglud (1974) Schwirian and Thomson (1972) and Jame and Pafford (1973).

Lively (1973) study deserves special attention as one portion of the study she taught 6th graders from the middle track of a suburban school a unit on multiplication of fraction using some of Blooms (1968) and Blocks (1971) mastery learning ideas. On the completion of the unit, diagnostic test was administered as a post test and pre test was done in the same way diagnostically. The result only a handful of students mastered the unit. Then she retested the students over the unit after some supplementary instrument. The result was encouraging. Similar result was found in the study of Selmens (1973-74). Those particular study showed girls (as a group) had significantly higher score than boys. This is an unusual result as it is the first study which showed this difference.

Schwirian and Thomson (1972) and James and Pafford (1973) have found relationship between father's occupational status and children attitude to science. The able students were less interested in science.

The separate science subjects of Biology, chemistry, and physics, many boys tended to drop Biology while girls gave up physics. From the study it is observed that the boys having inclination towards physics and girls having inclination towards biology. Other options showed that proportionally more girls than boys considered human Biology and rural science to be interesting whilst conversely more boys than girls chose to study electronics and technology for this reason. Similar result was found in the study of Jhonson and Bell (1987).

STUDIES CONDUCTED IN INDIA

Mehta (1966) made a first attempt to work in the area of Diagnostic test. Students of class ix and x of both sexes from rural and urban institutions were the sample for this study. Measurement of achievement Tests and chemistry was aimed out by the IIT Kharagpur sponsored by the NCER 967) Roop Prakash (1968 in physics which was in Punjab, Buch et al (1960) in Gujrat, Saxena and Gupta (1962) in U.P. and Haryana developed achievement test in general science for class eight students. Sood J.K. (1975) conducted a study entitled study of attitude towards scientists. comprised of 1000 students and teacher the tools of research were 'An attitude scale the test in the understanding science . (TOUS-) The socio economic status scale, and the concerned examination marks of students were also used. The major finding of the study were:

- 1) The sample reflected positive attitude towards science and scientists which was significantly related to the understanding of science.
- 2) The attitude of students and teachers differed significantly.
- 3) There was significant difference in attitude towards science and scientists between National talent research (NSTS) awardees and non selected NSTS students.
- 4) Sex was not significantly related to attitude towards science. There was significant difference between NSTS and non NSTS students regarding understanding of science.

Rawat (1976) and Sharma A. K. (1976) prepared diagnostic tests in chemistry. Prepared diagnostic test to teaching of Chemistry for class IX, conducted an experimental study on the effect of unit tests on retention following programmed material in a regiment of chemistry and found that the students using programmed material with or without unit test showed significantly better retention after one week than the students not using programmed material. Similar results were found in the study of Satia K.K. (1976) and Bhuru Singh Mann (1981).

Gupta S. M. (1982) in Gujarat prepared standardized test of creativity in physical sciences at The important findings were

- (1) The students did not read beyond the syllabus and did not inculcate the habit.
- (2) Science students were found to be weak in numerical work. Expression was very weak as they did not prepare their own notes. Similar result was found in the studies of Singhal K.N (1983).

Ramesh K (1984) his doctoral research carried out an experiment to study the effects of PSI and Bloom's Mastery learning strategy on the retention of high school students in a segment of science. He found that the groups taught using PSI and Blooms Mastery learning strategies do not differ on immediate retention measured in the form of performance on the summative criterion test while both the groups were superior to that taught through conventional method. Similar results were found for retention after two weeks. Similar result was found in the studies of Gangoli S G and Gururaj Murthy C (1985).

Mehna V.H (1986) An investigation into some factors affecting academic achievement in science of standard IX students of Greater Bombay the findings were that the pupils performance in science improved (1) If Teachers succeed in generating a feeling of liking for them among pupils (2) If teachers develop attitude for science among children providing scientific information.of some methods of teaching physics on the Achievement in physics of class X students in Delhi Univ.

The findings were that traditional method or lecture cum demonstration method followed by the verification type of laboratory work was more effective than the assignment cum discussion method.

With respect to Achievement in physics programmed instruction method of teaching physics was less effective than the method of teaching physics systematically designed by the investigator.This method was found to be the most effective over all other methods.the Teacher, social demands effect of environment, friends, motivation, sex, I.Q curriculum and a host of other factors.

II The human performance that we identify with the words general ability; scholastic intelligence and Aptitude have merged on the basis of measurements and validation procedures in an education system of a particular Kind. These intelligence and aptitude factors have taken on significance because of their relationship to learning process or different educational techniques. Since other educational system provides a limited range of educational options for adopting to different individuals these abilities that might be additionally useful if, alternative ways of learning were available.

Major finding is that Science is a compulsory subject to be taught from the class I to X in our schools (recommendation of education commission). They cannot be allowed to show poor performance and low achievement. They have to be given supplementary material to attain the specified (required) mastery level.The new strategies of science education have to be used in order to improve the performance in this context. There are many factors which cannot be controlled by the teacher or the system. Whatever method can be used to bring all the pupils to a set mastery level has to be researched.Hence the researcher thought of undertaking an investigation to study the effect of teaching learning strategy of PSI in improving the learning of science at school level.

Kalaivani A. (2014) in their paper entitled '**Personalized system of instruction (PSI Methos) for innovative Teaching Method and Techniques**' have reported the process has undergone several changes from non-formal to formal with passage of time. Teaching as conventionally understood by a traditional teacher. The PSI has been tried out in all area .in her studies she come to a conclusion that: The PSI method is effective and yields better results than another comparable method but the question is whether we may introduce it in our system of higher education. It is too early to predict its effective and efficiency in our country without conducting studies on the model of PSI. The method needs comprehensive planning and preparation before it is introduced. She focused on need to do more study on PSI in our country.

OwolabiH.O.(2010) in their paper entitled ' Effect of Personalized system of instruction on senior secondary school students performance in mathematics '. This study was designed to find out how effective one of the mastery learning strategy methodologies is by carrying out an experiment to determine the effect of Personalized System of Instruction (PSI) on the performance of senior secondary school students in Mathematics. The post test only control group design was adopted with two groups of senior secondary school (class one) students, each consisting of 25 participating in the study. One of the groups was exposed to PSI while the other got the conventional instruction It was observed that Mathematics, which has given the greatest problem to most secondary school students, needs a presentation that is motivating and persuasive. It seems that its adoption may take the perennial failure out of the school system. This study has established the possibility of the adoption of PSI for the improvement of learners performances at the senior secondary school level of education in Nigeria.

Atsushi Akera(2014)in their paper entitles' The Personalized System of Instruction and Its Application to Engineering Education' This is a paper about the application of Skinnerian behaviorism in one domain of education via a self paced system of instruction known as the Personalized System of Instruction (PSI). PSI was an early example of an inverted classroom developed by Skinner's close friend and colleague, Fred S. Keller.Utilizing Thorndike's theory of effect and broader behaviorist principles about learning, PSI was built around small study units with tightly specified learning outcomes. Based on ideological as well as theoretical commitments, PSI was also designed around the concept of mastery, so that only students scoring 100% on the unit tests were allowed to proceed on to the next unit. In return, every student who completed all of the units in this programmed learning environment earned an A. With PSI, the grade, as well as progress towards a grade served as a generalized reinforce in a manner similar to, and indeed paralleling the development of token economies in the 1960s. This article is grounded in the pluralist framework for the behavioral sciences established by Longino (earlier1; 2013). It also draws on an ecological outlook towards knowledge in paying close attention to the political contexts, institutional etiologies, and the circulation of knowledge that contributed to the rise and fall of PSI. This will take the story into some fantastic terrain, from Brazilian revolutionary history, to post-Sputnik concerns about an engineering manpower(sic) crisis, to the growing concerns about stagnating US industrial productivity during the 1970s that contributed to the downfall of PSI. We focus on Personalized System of Instruction's application in engineering education because PSI enjoyed a broader circulation there than in any other discipline.

Khawla Mahmoud Nahar Alalwneh(2018)in the paper entitle "**The Impact of Personalized System of Instruction (PSI) on the Achievement of the Students in Vocational Courses**" The purpose of this study is to identify the impact

of personalized teaching strategy on the achievement of the students of vocational courses. The descriptive analytical method was used in order to answer the questions of the study, and a sample which consists of (62) female students was selected purposefully from among the students of Irbid University college, which is a branch of the Balqa' Applied University, in the academic year 2017/2018. The participants of the study were divided into two groups, the experimental group which was taught using the personalized system of instruction, and the control group which was taught using the traditional teaching method. Results of the study showed significant differences in the achievement, between the experimental and control group.

Hannon, Holt, and Hatton (2008), entitled Personalized system of instruction model: Teaching health-related fitness content in high school physical education. In the study, 26 students enrolled in a high school physical education weight training course were taught over three weeks a unit on post rehabilitation using the PSI instructional model. Data was collected using audio-visual equipment, student and teacher observations, as well as a student survey using a Like rt scale. Observation data was coded independently by two trained graduate students as well as the researchers and the inter-rater reliability for frequency and duration coding was found to be in acceptable range (93-97%). Researchers found that 93.4 % of students met or exceeded performance criteria. PSI model could be successfully implemented in a physical education weight training course with a high degree of success for students. Similar findings was found in the studies of Cregger and Metzler (1992).

Pritchard, Penix, Colquitt, and McCollum in 2012, entitled Effects of a weight training personalized system of instruction on fitness levels and knowledge. In the study, the researchers used Fitness gram assessment and a fifty question knowledge test as a pre and post test assessment to measure the effectiveness of PSI in a fifteen-week beginning university physical education weight training course. The Fitnessgram assessment included the progressive aerobic cardiovascular endurance run (PACER) test, back-saver sit and reach test, trunk lift test, push test, and percentage body fat test. The fifty question knowledge test (McGee & Farrow, 1987) was designed to assess overall weight training knowledge. Participants included 17 male and 5 female university students with an age range from 18 years to 48 years, (M = 20.77, SD = 6.24). A paired sample test with a Bonferoni correction was used to compare pre and post test scores. Researchers found a statistically significant difference in the pre and posttest scores for the curl-up test, push-up test, percentage body fat test, and knowledge test. There was no statistically significant difference found between the pre- and post-test scores on the PACER, back-saver sit and reach, or the trunk lift tests. Researchers concluded that the PSI model was effective in raising achievement.

CONCLUSION

(Metzler, 2005). Taveggia (1976) reviewed 14 comparative studies of PSI to conventional teaching methods in higher education from several disciplines and found the PSI courses to be superior.

Kulik (1976) reviewed 31 studies comparing PSI to conventional teaching methods and found that of the studies, 25 of them produced favorable results for PSI. More recent meta-analysis studies by Kulik et al (1990) compared exam scores of PSI with Bloom's Learning for Mastery model and found that of the 67 studies reviewed, 62 of them reported higher final exam scores for students who received the PSI.

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