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## **Educational theories and approaches affecting on students achievement: A critical analysis**

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### **Abstract**

Learning is a complex process by which we can convert information and experience into knowledge, skills, behaviors and attitudes. There are various learning theories that help explain how we learn. There are also many teaching methods that have been shown to provide positive results. The present study aims to analyze the content of current research on theories and approaches affecting student achievement in the India context. A total of 69 studies published in well-known journals in the field of education were reviewed. The results of the study showed that the most frequently studied theories and approaches in India related to student achievement / outcomes were of multiple intelligences theory, theories and approaches based on technology and constructivism. The majority of studies reviewed used experimental design and found a significant mean difference in favor of the experimental group. At the end of study, the results were discussed and the necessary implications and suggestions were made.

**Keywords:** new trends in education, educational research, educational approaches, student outcomes

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### **Introduction**

Policymakers and educators have long sought ways to improve education and achieve desirable outcomes for students. As a result, the issue of student achievement has become a focus (Greenwald *et al.*, 1996) [28], and it has long been studied by researchers from various angles. By way of illustration, teacher thinking, teacher characteristics, teacher quality, teacher preparation and professional development are some of the issues whose impacts on student outcomes are explored (Boyd *et al.* 2009; Clark, 1988; Cochran-Smith & Zeichner, 2005; Darling -Hammond, 2000; Goodlad, 1990; Guskey, 2002; Shann, 1998) [7, 15, 16, 17, 27]. In addition, teacher certification, degree level, years of teaching experience, subject certification, exam results, class size, school resources, student background, parent involvement and parenting styles are other promising variables that affect student achievement (Brown & Iyengar, 2008; Christenson *et al.*, 1992; Ehrenberg *et al.*, 2001; Goldhaber and Brewer, 2000; Greenwald *et al.*, 1996; Harnisch, 1987; Henderson, 1987; Mervis and Leininger, 1993; Heyneman, 2005; Monk and King, 1994; Raymond *et al.*, 2001; Summers and Wolfe, 1977) [13, 19, 26, 28, 31]. In addition, there are a large number of studies examining the effect of theories and pedagogical approaches on student achievement. This review attempts to use a systematic method to analyze the results of existing research on the impact of various theories and approaches on student outcomes for policy makers and educators. The findings on educational theories that have a significant impact on student outcomes are very applicable to the discussions and educational policies developed in India.

### **Reviw of Literatures**

Multiple Intelligences theory (MI theory) advocated by Howard Gardner (1993) [24] pointed out that there exist different kinds of intelligences in human mind which can be discovered if suitable environment is provided. For that reason, MI theory requires the teachers to use variety of techniques, methods, activities, tools

and strategies to explore and foster those intelligences of the students (Armstrong, 2000; Campbell & Campbell, 1999) [3, 11]. Constructivist learning approach existed since ancient times and thrived by Glasersfeld, and it was derived from the idea of “the human mind can know only what the human mind has made” (Vico, 1710, as cited in Von Glasersfeld, 1989, p.4) and emphasizes students’ active construction of their knowledge in the teaching and learning process. Additionally, according to this approach, the learning environment should provide students with the opportunities to construct their own knowledge (Null, 2004). As stated before, the primary school curricula in Turkey have been renovated and the underlying theory of the new curricula have been claimed to be changed from behaviorism to constructivism (Bikmaz, 2006; Bulut, 2007). Within this frame, the materials, activities, and all other components of the teaching and learning environment are still being re-designed or renovated in schools. The curricular and instructional activities are also being affected by these reform movements. For that reason, its implementation and effects are vehemently being discussed by teachers and other professionals in educational area. Not only in Turkey, but also in most of the world, the educators have been attracted by the constructivist education (Powell, Farrar & Cohen, 1985) [20], as the priority of constructivist learning approach is the learners. In this frame, there have been many different definitions of constructivism. As described by Sherman and Kurshan (2005) the constructivism is to have a linkage between the previous learning and the new learning through making connections. Moreover, learning occurs inside the learners and it is an internal process, so the constructivism deals with how the learner learns internally and how they construct their knowledge on their own (Suchting, 1992; Von Glasersfeld, 1985) [30, 33]. Regarding all these ideas and definitions, it can be asserted that the constructivist teaching approach mainly takes the learning of the learners at the center and accepts the active nature of the learning

as different from the traditional ways taking the teacher and lecturing at the center. Another example of used instructional approach is technology-based learning approach developed in 1900s and to be developed continuously. Together with the developments in technological arena, education has also benefited from this trend; and the concept of instructional technology has gained much popularity. As Schacter (1999) states: "Research on the impact of technology on learning is in its infancy though we are beginning to see solid work emerge (p.3)." The usage of technology in educational activities has been increased and encouraged in recent years, so it is possible to observe its applications at schools and in everyday life. For that reason, the technology has also been integrated into teacher education at colleges of education (Carrier, 2006) <sup>[12]</sup>. In Turkey, the instructional technology has been flourished and used in many classrooms by the teachers. As argued by Oliver and Herrington (2003), technology has been used to enrich learning environment by increasing the effectiveness of teaching-learning activities and educational practices if learning settings are planned "based on meaningful relevant activities and tasks which are supported in deliberate and proactive ways by the tutor" (p.111). Apart from all of these, brain-based learning, critical thinking, problem-based learning, active learning, project-based learning and others have also 689 been utilized by the educators and they have been affecting the direction of educational research thorough their effects on student achievement or attainment.

### Objectives

The researchers identified the following objectives of the present study-

1. To study the various learning Theory
2. To Explain the educational theory impact on the students' outcome

### Methods of the Study

The study is a review study, so the sample of the study is composed of the research articles published in five major educational journals and the Master's and Ph.D. theses in India. The selected educational journals, from which the articles were derived, include Eurasian Journal of Educational Research

(EJER), Elementary Education Online (EEO), and Educational Sciences: Theory & Practice (ESTP), The study included totally 69 studies meeting the criteria for inclusion in literature.35 of them were articles from 6 journals mentioned above and 44 of them were master's and PhD theses meeting the pre-determined criteria of the study. The theses were selected from Higher Education Council's (HEC) website. The studies have some similarities in terms of methodology selected. All of the studies reviewed employed quantitative design, studying the effects of particular theory on student outcome.

Among these methods, the main research design was experimental or quasi-experimental design. The researchers conducting these studies generally selected two groups which were experimental and control groups. Then, they implemented an instructional plan prepared by considering basic principles of the selected theory/approach to experimental group. The selected lessons were generally redesigned using the principles of studied methods/approaches, which were integrated into the general course content so that their effects could be tested by the researchers.

### Data Base

The studies, which comprised the sample of the study, were analyzed using the content analysis method. As stated in the literature, the content analysis is a data analysis method which utilizes some procedures to make meaningful inferences from a written document (Weber, 1990) <sup>[35]</sup>. All of the studies were firstly categorized based on the journal and the year of publication. Then, they were re-categorized using a table based on their title and aims, publication type, year of publication, the theory, method, or approach used in the study, the target population, used research method, and results. Besides content analysis, frequencies and percentages were also used to display the results in more numerical and visual ways.

### Results and Discussion

The results obtained from 69 studies showed that there were main educational theories, methods, and approaches studied by the researcher as displayed in figure1.

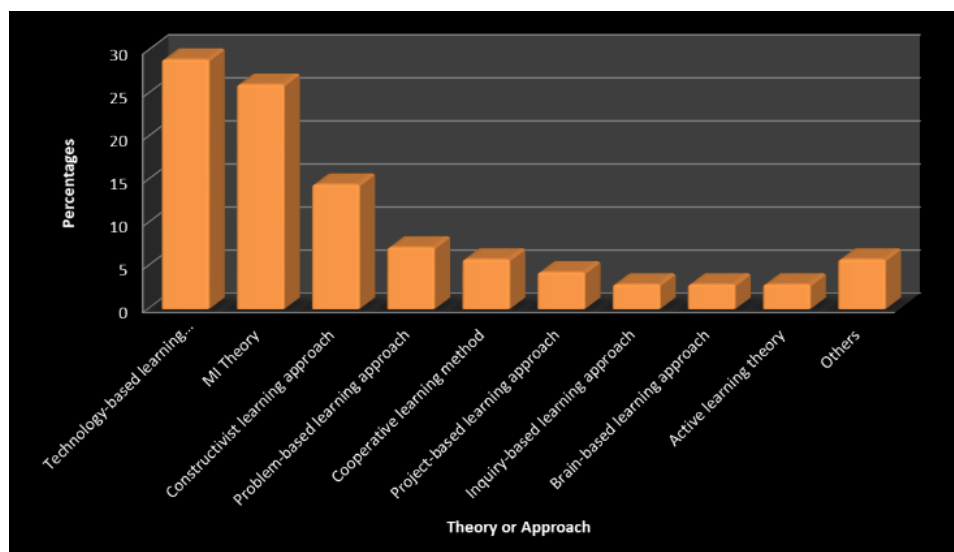


Fig 1: Educational theories or approaches for learning

As figure1 shows 18 of the studies were on the effect of MI Theory; 20% of them were on Technology-based learning theories and approaches. The studies on technology were mostly on Computer-assisted learning, Programmed Learning, and Web-based educational activities. Moreover, 10 % of the studies were on Constructivist learning approach. The researchers themselves or the teachers used some constructivist methods and techniques throughout the semester or an academic year; and the researcher examined the effect of these methods and techniques on the

students' success using various measurements. Lastly, 5% of the studies were on the effects of Problem-based learning approach. Other than these three educational methods and approaches, the other approaches were also observed to be used in educational research in relation to student outcome. These theories included Cooperative learning, Project-based learning, Inquiry-based learning, Brain-based learning, and the Active learning approaches.

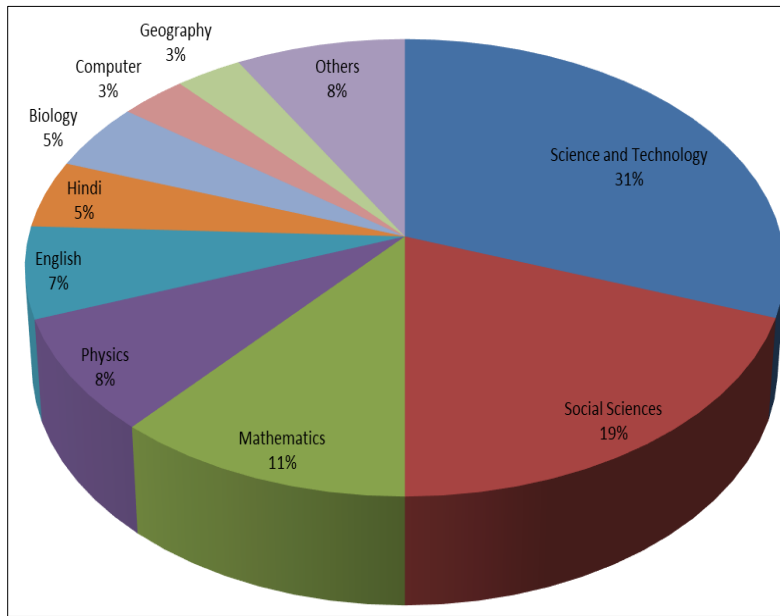


Fig 2: Studies by Disciplines and Subject Area

Regarding the disciplines and subject areas studied, it was observed that 31% of the studies were conducted in the Science and Technology course; 19% of them were studied in Social Sciences course; 11% of the studies were in Mathematics course; 8% of the studies were applied in Physics course; and the other studies conducted in other areas such as English, Geography, Computer, and Biology (Table 4). The other subject areas constituting the 8% of all were religion, citizenship and human rights, music, chemistry lessons, or multidisciplinary studies.

The data obtained from 69 studies showed that 21.7% (n=15) of the studies were conducted with 7th grade students; the sample of the 14.5% (n=10) of the studies were 8th graders; 15.9% (n=11) of the studies were with 5th graders; 17.4% (n=12) and 11.6% (n=8) of the studies were conducted with 6th and 9th grade students respectively. Other studies were conducted with various grade levels such as 10th grade, 3rd grade, and 11th grade (Figure: 3).

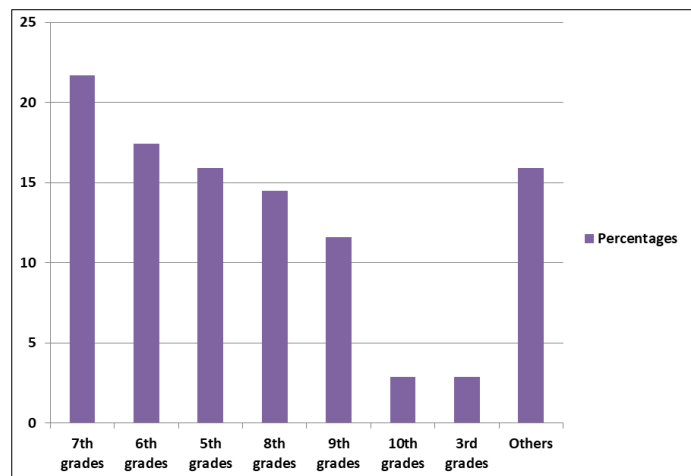


Fig 3: Studies conducted with grade student

As observed in the Figure above, majority of the studies were conducted with 5th, 6th, 7th, 8th, and 9th grade primary school students.

### ***The impact of Theories and Approaches on Student Outcome***

Almost all of the studies reviewed found significant mean differences between control and experimental groups in favor of the treatment group studied. In other words, instructional design based on a particular theory/approach had a significant effect on student achievement or attainment. In the study published in one of the journals, the researcher found that the seventh-grade students exposed to the case-based learning displayed significantly more success in science lesson than the control group (Horzum & Alper, 2006). In another study, the researcher used a pretest-posttest experimental design to examine the effect of constructivist learning environment on seventh-grade students' math achievement (Özerbaş, 2007). The results again proved that the students were significantly more successful when compared to the control group with traditional methods. Similar to these studies, other studies also concluded with the significant effect of these methods and approaches on student outcome. The researchers discussed this effect and its reasons besides recommending the use of these approaches and methods in classroom environment to increase the student achievement. On the other hand, in three of the studies (2 of them were on technology-based theories and approaches and one of them was on MI theory) a significant effect was not found. To give an example, in one of the Ph.D thesis, the researcher investigated the effect of multiple intelligences on the 8th grade students' success in Human Rights and Citizenship course. At the end of the experiment, the researcher found no significant change in the achievement level of the students when compared to the control group.

### **Major Finding**

The main motivation of this study was to explore the current dispositions on educational theories and approaches investigated in relation to the student achievement or attainment in educational context of Turkey. The basic contribution of this review would be to create a clear interpretation of the existing research for policy makers, curriculum developers, and researchers interested in the relationship between application of educational theories in classroom setting and student achievement. The results showed that most frequently studied educational theories and approaches were Technology-based theories and approaches, MI theory, and Constructivism. Also, these theories and approaches were found to be mostly studied in science and technology, social sciences, and mathematics courses. The reviewed studies were generally conducted in primary level; and experimental design was utilized resulting mostly with the significant effect in favor of the theories and approaches.

To start with, the results of the analyses indicated that the Technology-based theories and approaches, MI theory, and Constructivism were most commonly studied especially in the years 2005, 2006 and 2007. When the nature of these theories and approaches are examined, it is seen that they have been developed in recent years and studied by the educators in other countries as well. Among these, Technology-based learning theory/approaches were also found to be most frequently studied

theories/ approaches in relation to student outcomes in Indian educational context in the last two decades. As known, together with the rapid technological developments in the world during the recent years, technology has been more integrated into the educational activities and programs to increase the effectiveness of learning environment for the learners (Smeets, 2005) <sup>[28]</sup>. For that reason, this popularity and rapidly growing use of new educational technologies has given way to amplifying demands for new and continuing processes and outcomes of teaching and learning (Alexander & Boud, 2001; Boud & Prosser, 2002) <sup>[2, 6]</sup>. The effectiveness of these processes and outcomes has been examined through the educational research and the popularity of the technology in human life has been reflected upon the research on technology-based theories.

Moreover, MI theory developed by Howard Gardner (1993) <sup>[24]</sup> has a world-wide popularity. Since the book on MI theory was published, there has been an increasing trend to integrate the multiple intelligences into educational practices and discuss its effectiveness to improve the student outcomes (Armstrong, 2000; Christison & Kennedy, 1999; Nolen, 2003; Rubando, 2002; Vincent & Ross, 2001) <sup>[3, 14, 32]</sup>. Parallel with the trends in educational research, MI theory was also found to be most frequently studied theory in relation to student outcomes and attainment in this study. There are numerous researchers studying and examining MI theory after the year 2000 (Bümen, 2004; Demirel, 2002; Selçuk *et al*; 2004; Yavuz 2004) <sup>[10, 20]</sup>.

In this study, another most frequently studied approach in relation to on student outcomes in recent years was found to be constructivism. As elucidated above, the reason for this popularity might stem from the recently implemented primary school curricula, which was stated to be based on constructivism by Ministry of Education (The Board of Education, 2005). Moreover, constructivism has been of the mostly discussed approach in educational area in the last decades both in national and international literature (Erdem & Demirel, 2002; Fidan, 2003; Powell, Farrar & Cohen, 1985; Sherman & Kurshan; 2005) <sup>[20, 21]</sup>.

Furthermore, the reason for studying these specific approaches and theories might be sought in the literature of teacher education, as the teacher education in India has generally been in line with the developments in the society (Üstüner, 2004). In recent years, there have been considerable efforts of Higher Education Council (HEC) to renovate the teacher education programs together with The World Bank (HEC, 1998; HEC & The World Bank, 1999). The newest change was initiated in 2007 (HEC, 2007). In the new programs, these new concepts, theories, and approaches - Constructivism, Multiple Intelligences theory, Computer-assisted instruction, and others- have been integrated into methodology courses in universities. Starting from 1998, the integration of these current educational theories, concepts and approaches, and their effects on teacher education have been studied by researchers. For instance, Gürşimşek (1998) suggested that the new concepts, theories, approaches, practices such as constructivism and MI theory should be the part of instruction in teacher education. This changing face of the research in teacher education might have an influence on the increasing use of these approaches and theories in educational context in India in the last decades. Another result revealed in this study was that most of the studies on student outcomes were centered upon certain disciplines and courses, which were science and technology,

social sciences, and mathematics in primary grade levels particularly in 6th, 7th and 8th grades. The reason for this might be that these subject areas are the main ones in the new primary school curriculum, and the international exams have been established more on these core disciplines. In addition, as part of the curriculum development activities the content and the methodology used in these courses were revised on the light of new approaches adopted by the Ministry of Education.

It was also found in the study that the research design in those studies was experimental design. Through experimental design, the researcher can go beyond description and prediction (Fraenkel & Wallen, 2003, p.268) <sup>[23]</sup> to drawing conclusion about the population based on the findings obtained from the experiment. In addition, as Krathwohl (1998) proposed: "For them [some socialscientists], experimentation is the most effective method for creating a consensus around the existence of a cause-and-effect relationship." For that reason, the nature of the experimental design is more suitable to test the effects of the theories, approaches, ideas, or concepts on the learners and teaching learning process.

Lastly, the results of the study revealed that the effects of those studied theories and approaches –MI theory, Constructivism, and Technology-based learning were found to be significant nearly in all of the studies, except for three, in this study. This might be an indication of the effectiveness of those theories and approaches in educational context. At this point, although the

Information provided by this review is meaningful for policy debates, there are many important

Questions that remain unanswered. To illustrate, these results would differ if outcomes like gender, socio-economic status, parent education, and computer and technology opportunities of students at their homes were examined. Moreover, for many teacher characteristics such as experience, and education, the results may not be conclusive. Although the success of the instruction eventually depends on teachers regardless of the theory of the instruction given in the classroom, according to Fletcher (2003) <sup>[22]</sup>, there are fewer students left behind when the technology-based instruction is centered. Furthermore, MI theory has been also proved to have the positive effects on students' attainment (Armstrong, 2000) <sup>[3]</sup>. Constructivism is also stated to provide wide range of learning opportunities to increase student success (Wilson, 1996) <sup>[36]</sup>. The presented studies indicated the effectiveness of these theories and approaches on student achievement. For that reason, this signs that the rationale behind the reform movements –integration of new theories and approaches into new programs in primary and secondary level– seems to reach its purpose as long as they are utilized in the right content, time, and environment and with an effective management.

The general conclusion of the presented study is that some educational theories and approaches are systematically related to student achievements, which are large enough to be educationally important. To sum up, the results in this study indicated that the mostly studied theories and approaches in the educational area in current years have been affected by the socio-cultural, technological and scientific changes as well by the needs of the society in India. It was also found that the educational, more specifically instructional practices developed and implemented on the base of recent theories and approaches had a significant effect on student achievement at primary level social studies,

science and mathematics courses. Therefore, these results in relation to theories and approaches have considerable implications for curriculum development, instructional design, teacher decision-making, and assessment issues should be taken into consideration seriously. In this review, the findings suggest that the curriculum developers need to take these significant findings into account and integrate the teaching-learning methods and activities suggested by those theories into the related programs. For further studies, this study could be extended to international platform from the India case to gain more insight in the effect of recent theories and approaches on student outcomes in other cultures.

## Conclusion

The findings from this study have implications not only for curriculum development, but also instructional design, and teacher education. Although one might want to find a single solution for all the problems in classroom learning and teaching, there is not a sole method that can solve all those problems in such broad applications (Liang & Gabel, 2005). The findings of the present study have indicated that different instructional strategies and curriculum theories have positive effect on the student attainments in different classroom settings, grade levels, and disciplines. Therefore, curriculum specialists and teachers should be aware of the characteristics of students, and the type of theory/approach which is more suitable for the instruction by considering the physical facilities of the schools and needs of the society.

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