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A STATE-OF-THE-ART REVIEW ON STUDIES IN MULTIPLE INTELLIGENCE AND ACADEMIC ACHIEVEMENT

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Abstract

In this article, review of the studies carried out in the field of Multiple Intelligence. The reviews have been gathered through primary source, Database and internet. The review of related literature presented in here contained theoretical details related to multiple intelligence and academic achievement and also the research conducted in this area. The investigator revealed so many studies, which included both Indian and foreign studies.

Keywords: Academic Achievement, Instructional Approach, Multiple Intelligence, Teaching-Learning Process.

Introduction

According to Mills (2019), "the review of literature involves the systematic identification, location and analysis of documents containing information related to the research problem. The review tells the researcher what has been done and need to be done".

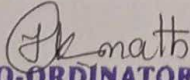
According to Good, "The key to the large storehouse of published literature may open doors to sources of major issues and explanatory hypotheses, as well as give useful guidance for problem description, background for approach selection, and comparison data for result interpretation. To be really creative and innovative, one must read widely and critically as a stimulant to one's thought".

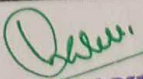
Purpose and Need for the Review of Related Literature

In addition to providing a basis for qualitative research, a review of related literature allows the researcher to get acquainted with current knowledge in the topic or area in which the researcher will conduct study. As a result, in educational research, a thorough study of the literature relevant to the subject under investigation is essential.

Review of related literature serves the following purpose:

1. It indicates if the existing evidence is sufficient to solve the problem without further study. In this example, the review supports in the elimination of superfluous duplication. If the researcher is dissatisfied with the processes used by prior researchers to solve the problem, the study might be conducted utilising novel, alternative, or refined methodologies. Furthermore, it should not be assumed or generalised in educational research that because a problem has been investigated under one set of variables, the issue is resolved in all other scenarios. Second, in order to keep up with the newest trends and changes, normative studies that deal with current situations must be performed at a reasonably frequent interval. Thirdly, educational research investigations must be repeated under identical settings in order to validate the findings of prior studies.
2. The review also informs the researcher of what has been done, discovered, and accepted, which aids in future work. As a result, it will be quite useful at the stage of 'finalising the problem for research selection.'
3. It contributes new concepts, theories, explanations, or hypotheses that are useful in defining the problem. It helps in the definition and delimitation of the problem in terms of objectives, questions, and hypotheses. As a result, it's really beneficial when it comes to 'formulating the problem.'
4. The review offers a research approach that is suited for the situation at hand. The researcher will learn about the approach followed by prior researchers through the review. This assists the researcher in selecting the proper research method(s) for his topic. He can use appropriate ways to replicate, improvise, alter, improve, integrate, enhance, or invent. As a result, review is determined to be beneficial at the 'planning of research' stage.
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comprehensive evaluation of the literature gains confidence in their study strategy and execution. As can be shown, a study of related literature is beneficial at all phases of educational research, from issue identification and formulation to planning and implementation, and finally report writing.

Studies Related to Multiple Intelligence

Zyrkowski (1993) studied the structure and development of human intellect. The study's participants ranged in age from 16 to 74 years old. The data was collected using the Wechsler Adult Intelligence Scale Revised (WAIS-R). Factor analysis was utilised as a statistical tool. The study revealed four core intelligences (verbal, memory, perceptual, and spatial abilities), as well as two solo intelligences (concept creation and practical thinking). The findings also offered a new hypothesis of multiple intelligence, based on the discovery of six different types of human abilities.

Carson (1995) investigated diversity in the classroom in an experimental study. The study's goal was to see if using the multiple intelligence technique to solve mathematical problems made a difference in the problem-solving abilities of individual students or groups of students with different learning abilities and cultural backgrounds. The study included 118 fifth-grade pupils, with 59 in the control group and the remaining 59 in the experimental group.

The data was analysed using a split-pilot analysis of variance statistical design. The gains of the experimental group were substantially greater than those of the control group, according to the findings. In the experimental group, the number of problems tackled, the elegance of solutions, and the accuracy of responses were all improved.

Mitchel (1995) investigated multiple intelligence theory as a theoretical basis for art appreciation. The author emphasised the significance of the study.

The history of philosophical debates on the nature of the mind and knowledge is extensive. Since the time of Plato and Aristotle, there has been a schism between those who believe intelligence is a single ability and others who advocate a diverse approach to the mind. Gardner's hypothesis of multiple intelligences, which he introduced in 1983, ushered in a new era in the debate over the nature of human intelligence and its pedagogical consequences. Gardner's theory refutes the idea that intellect is a single process. According to the MI theory, there are at least seven semi-autonomous intelligences: linguistic-verbal, musical-rhythmic, logical-mathematical, visual-spatial, each intelligence, or "frame of mind," may be viewed as a distinct manner of knowing as well as a medium for communicating that knowledge. This research has three objectives: (i) establish and articulate a rationale for using Gardner's theory of multiple intelligence as a theoretical foundation for curriculum development in art education; (ii) put theory into practise by articulating a multiple intelligence-based approach to art appreciation and developing, as a model, an introductory art appreciation course for post-secondary non-art majors; and (iii) To explore and make recommendations about the implications of a larger application of a multiple intelligences-based approach to art education.

Mueller (1995) investigated the educational consequences of several IQ groups in a cooperative learning setting. 22 pupils from Metcalf Laboratory School's fourth grade class. The study's goal was to look at how a diverse multiple intelligence cooperative group and a homogenous multiple intelligence cooperative group interacted and acquired subject knowledge.

The data was collected using an experimental approach. Tools such as observation, field notes, written diary entries, interviews, and a networking questionnaire were utilised to measure social integrations. The study found that from the pre-test to the post-test, all pupils in the class benefited. The students' content understanding was not harmed by the split of cooperative learning groups by diverse intelligence strengths.

In his study, **Radford (1995)** looked at how Gardner's theory of multiple intelligences and Mihali Csikszentmihalyi's flow theory affected the lives of 13 fifth-grade students. Students usually considered of themselves as having strengths and abilities to contribute, according to the findings. In addition, meta-cognition and self-awareness proved to have an important impact in students' individual achievement.

Scott (1996) did research on multiple intelligences and African-American pupils' gifted classification. The Teele Inventory of Multiple Intelligences (TIMI) and the Otis-Lennon School Ability Test (OLSAT) were employed. The efficacy of the TIMI's subscale (intrapersonal intelligence) and the OLSAT to identify talented African-American pupils, as well as to identify gifted individuals as a function of race, was shown to be statistically significant in this study. In general, there was no substantial difference in the TIMI and OLSAT's ability to identify talented children. The ability of the TIMI's visual-spatial intelligence and bodily-kinesthetic intelligence subscales, as well as the OLSAT, to identify gifted pupils was statistically significant.

Goldblatt (1996) investigated the value of art in education both within and outside the classroom (multiple intelligence, multiple cultural). The study's goal was to understand the role of art from a variety of angles, particularly as a teaching tool. According to the findings, art plays an important role in the teaching-learning process.

Gum (1997) conducted a research study on Computer programming: Science, Art, or Both? (Field dependency, spatial intelligence, logical intelligence) The study's main goal was to determine if visual-spatial intelligence had a role in a student's performance in a computer science major, or if mathematical-logical intelligence was adequate data to establish a successful outcome. 15 computer science majors and 15 non-computer science majors enrolled in a statistics class was considered as the study sample.



Cover Page



Multiple Intelligence Inventory for Adults, Group Embedded Figures Test (GEFT) to determine field independence, Card Rotations Test to determine visual-spatial orientation ability, Maze Tracing Speed Test to determine visual-spatial scanning ability, and Surface Development Test to determine visualisation ability were used as tools in the study. The findings showed that computer programming expertise improved field independence, visualisation ability, and visual-spatial scanning ability while lowering visual-spatial orientation ability. Only a perception of linguistic-verbal intelligence exhibited a positive association across all groups; it had a negative correlation across all other intelligence perceptions and measures in at least one of the groups.

McGraw (1997) investigated the relationship between multiple intelligence theory and seventh-grade mathematical learning. The study's sample consisted of six seventh-grade mathematics courses that were allocated to treatments at random. In the first portion of the study, four of these groups took part in a Solomon four group design to evaluate the effectiveness of multiple intelligence theory-based reinforcing tactics against traditional reinforcing approaches. In the second portion of the study, students were divided into groups based on whether they scored in the top, middle, or bottom third on a self-reporting test for each of the seven intelligences. The study's findings revealed that employing various intelligences in a non-aligned way did not make a meaningful impact in students' acquisition of mathematical concepts.

Melrose (1997) investigated at the learning disabled's strengths, using the Multiple Intelligences Theory as a growth paradigm (Learning, Intelligence). The goal of this research was to see how Gardner's multiple intelligence hypothesis may be applied. The study's main goal was to accomplish two things. The first sought to discover broad intellectual tendencies among kids with learning disabilities. The second goal was to create user-friendly information that would allow teachers to aid pupils in achieving academic achievement. Observation, questionnaires, and interviews were used to gather information. The findings demonstrated that, despite their considerable cognitive problems, the learning impaired pupils possessed a wide range of talents.

Bean (1998) found that pupils exposed to Gardner's seven intelligences and Vygotsky's mediators, positively enhanced knowledge retention in this research of middle school students utilising Gardner's seven intelligences and Vygotsky's mediators to construct classroom instruction.

Martin (1998) assessed multiple intelligences in 25 sixth-grade pupils aged 11 years old in experimental research. The goal of this research was to create a Multiple Intelligences Inventory for middle school students that teacher may use to detect and measure students' progress in seven intelligences that are consistent with a poetry unit in language arts. The goal of the survey was for parents to assess how well their judgments of their child's intelligences matched their child's replies. Linguistic-verbal, musical-rhythmic, logical-mathematical, visual-spatial, bodily-kinesthetic, interpersonal, and intrapersonal intelligences were all addressed in the survey. The study's findings revealed the extent to which parents' acknowledged behaviours match the respective student-indicated behaviours in terms of IQ domains.

Feeney (1999) investigates the influence of Gardner's multiple intelligences theory on changes in the language arts curriculum in middle schools. The aim of the study was to assess student performance, pedagogy, curriculum, and evaluation. When multiple intelligences were adopted, the largest amount of improvement was discovered in the area of student performance. When it comes to transformation, pedagogy comes in second and assessment comes in third. Curriculum reform was ranked last.

Mary (2000) studied at a few key features of multiple intelligences in her research. Eighty-one students enrolled in the college skills course at the College of Redwoods in Spring 1999, formed the study's sample. The participants in the study ranked themselves greatest in interpersonal intelligence and lowest in musical-rhythmic intelligence. The research also discovered that there were substantial disparities between interpersonal and the other seven IQ areas. Females scored better in all areas except bodily-kinesthetic, but for males only in bodily-kinesthetic and for females only in linguistic-verbal showed significant differences. Nineteen of the twenty-six particular skill subscales were higher for females. In the musical-rhythmic, bodily-kinesthetic, and linguistic-verbal domains, the variable of age revealed substantial variations. There were significant discrepancies in instructor and student ratings. The teachers are strongest in linguistic-verbal, intrapersonal, and interpersonal communication. Teachers showed a somewhat lower mean score to interpersonal and visual-spatial than students.

Nguyen (2000) used multiple intelligences learning to increase student accomplishment on standardised exams in his study termed as differential effects of a multiple intelligences' curriculum on student performance. The study's sample included fifth-grade pupils from a Massachusetts public school. The Californian Achievement Test / 5 (CAT/5) was employed as a research tool.

There was no difference between kids in the multiple intelligences programme and those in the standard school curriculum, according to the findings. There was no link seen between CAT/5 results and therapy for multiple intelligences. The many intelligences programme promoted a variety of activities and learning styles as an alternative to the standard classroom setting.

Muchlbaner (2000) investigated the impact of an arts-infused multiple intelligences curriculum on arithmetic proficiency. The findings of this study revealed that the arts-infused, multiple intelligences curriculum has no statistically significant influence on pupils' mathematics proficiency.



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Adamus (2000) investigated the impact of multiple intelligence theory exposure on high school pupils. This qualitative case study looked at how high school students' views of reality changed after being introduced to the multiple intelligence theory. Six 11th graders, three males and three girls, were chosen at random to participate in three-week research. After learning about the multiple intelligence hypothesis, the participants conducted a self-assessment of their multiple intelligence strengths and limitations. The findings revealed that the theory made sense to the participants, that they were able to recognise and tolerate others' multiple intelligence profiles, that they were able to evaluate their teachers' and schools' accommodations of the theory, that they used the theory to improve relationships with friends and family, and that they saw no differences in how each gender interpreted the theory.

In multiple intelligences classrooms and gifted education programmes, Vivona (2001) performed research on teacher perceptions of motivation, curriculum, and academic success of talented students. The study's findings revealed that gifted students' instructors believe that multiple intelligences programmes have no more influence on their students' motivation, curriculum, or academic accomplishment than gifted programmes alone.

Weiner (2001) looked for parallels across primary schools that have adopted the notion of multiple intelligences: A 21st-century guideline. The study resulted in the creation of a set of guidelines that included the use of self-selected student projects, computer assisted instruction, MI learning entries as instructional methods, encouraging students to recognise and identify their different intelligences, incorporating intelligences with understanding and depth, and using authentic – based assessment as much as possible.

Malm (2001) identified the distribution of Gardner's multiple intelligences among a sample of 246 students and 28 faculties in associate degree career programmes. The Multiple Intelligences Development Assessment Scale was completed by the participants. The individuals ranked themselves greatest in interpersonal and intrapersonal intelligence and lowest in musical and naturalistic intelligence, according to the findings. The high and low group results were routinely communicated with the students by the instructors in each group. The findings revealed statistically significant disparities in numerous intelligence levels across the various groups.

Arnold (2002) investigated the association between the theory of multiple intelligences implementation and fifth-grade students' views about school. Quantitative data was used in the investigation, and descriptive analysis was done. According to the study's findings, there was no significant change in student attitudes toward school between fifth graders who attended schools that partially used MI theory and those who did not.

In the same year Rockwood conducted a study on bodily-kinesthetic intelligence as praxis: A test of its instructional effectiveness. The investigators used the experimental method to compare the effectiveness of physical action (demonstrations) and explanations on the learning of occupational therapy. The tools used for the study were Rockwood Multiple Intelligences Scale and Branten Shearer's (1996) Multiple Intelligences Development Assessment Scale (MIDAS), and Bodily Kinesthetic Intelligence Sub Scale (BKI). Results showed that both groups learned the occupational therapy terminology equally well, but those in the kinesthetic-praxis, action-based learning enjoyed the lesson more and appeared more attentive and enthusiastically engaged, than those in the stationary group.

Worthington (2002) studied the topic a comparison of gifted identification method using measures of achievement, ability, multiple intelligences and teacher nominations. On a sample of 276 fourth grade students. The study investigated whether existing methods of identification for gifted programmes may miss some gifted students. By correlation, the investigator has analysed the data. Results showed that students identified by the traditional method differed from students identified by the multiple intelligences method. Subsequent analysis showed that student preferences for particular intelligences did not manifest in corresponding strengths in achievement or ability. It was possible that the multiple intelligences method missed more gifted students than the traditional method. Research on website usability and the hypothesis of multiple intelligences was undertaken by Ashmore (2003). The study included a sample of 12 children aged 3-6 years. Simpler navigation systems, interface designs that engage spatial intelligence rather than verbal intelligence, and elements that positively engage a number of intellect types, according to the findings, will make websites easier to use for youngsters.

Previti (2003) investigated middle school students' self-efficacy scores as evaluated by the Multiple Intelligences Developmental Assessment Scales. The goal of this study was to see how musical key boards and associated education affected people. The many intelligences theory profiles of Gardner were represented in the self-efficacy ratings of middle school pupils as evaluated by a self-assessment questionnaire (1993). A total of 352 sixth, seventh, and eighth grade children were included in the study. The researcher employed the experimental approach to compare the effects of musical key boards and related training on musical, spatial, and logical-mathematical subscale scores in middle school pupils in the treatment and comparison groups.



After controlling for pre-test scores as a covariate, the results indicated a significant difference in gender comparisons of post-treatment group participants. Significant evidence supports the idea that students' self-efficacy profiles might be greatly influenced by their perceptions of themselves.

Trujillo (2003) investigated the impact of varied intelligence teaching styles on subtractive bilingual students' cognitive academic language performance. Within one scientific unit, the researchers looked at the effects of several intelligence teaching methodologies and their effects on Cognitive Academic Language Proficiency (CALP) language. Along with the usual domains of verbal-linguistic and logically mathematical intelligence, the Multiple Intelligences idea emphasised the use of visual-spatial, musical, naturalistic, bodily-kinesthetic, interpersonal, and intrapersonal intelligence.

The research was carried out using an experimental approach. The study's sample included two groups of first-graders, instructors, and their families. The control group had a sample size of 20, whereas the experimental group had a sample size of 19. When the data was analysed using the t-test, it was discovered that the treatment group had considerably higher CALP language growth than the control group. Qualitative data also revealed that the power of multiple intelligence teaching strategies to augment (CALP) language was positive.

The study's focus, according to **Krishna (2004)**, was to compare the efficiency of techniques based on multiple intelligence theory on secondary school mathematics success in terms of instructional objectives. For the study, the researcher used an experimental approach and used a non-equivalent group design with pre-test and post-test. Lesson transcripts-based tactics including multiple, lesson transcripts based on the current approach, and a mathematics achievement exam were utilised as instruments. The study's findings revealed that teaching using multiple intelligence theory methodologies was more successful than the current style of teaching in terms of mathematics achievement under instructional objectives.

Dome (2004) explored the connection between technology and multiple intelligences the effect of instructing strategy on course completion rate and motivation of at-risk students. The purpose of this study was to determine whether students learning styles combined with instructional strategies increased student course completion rate and motivation to learn. The study sought to determine, whether at-risk students would experience more success with the material presented if the instructional strategy used was technology. The study was conducted with 20 participants and was a combination of quantitative and qualitative methods. The quantitative portion measured the correlation between the participant's scores in a learning style inventory, technology usage, and completion rate. The quantitative portion of the study took the form of surveys for the students to complete before and after the completion of the graduation portfolio. Results indicated that there was no significant correlation between the portfolio completion rate and any the individual learning styles.

In the Archdiocese of Detroit, **Gunst (2004)** performed research on multiple intelligence among instructors in catholic primary schools. The perception and usage of multiple intelligences by teachers were studied using a descriptive, non-experimental study method. The study's target group was school instructors. The IQ survey, the teaching methods survey, and a brief demographic survey were all employed in this study.

In this study, Catholic primary school teachers tended to have higher levels of logical mathematical, interpersonal, intrapersonal, and naturalistic intelligences, but lower levels of verbal-linguistic, visual-spatial, bodily-kinesthetic, and musical intelligences. The mean results for the eight multiple intelligences deviated considerably from the teachers' self-reported strongest intelligence. Teachers who self-report their best intellect were more likely to have the highest mean intelligence scores. These results might indicate that professors were aware of their greatest intellect and were instructing students utilising that intelligence. Teachers are more likely to employ instructional methods that are connected with their multiple intelligences. Teaching tactics were created to encourage student learning and aid in the development of their various intelligences.

Sohn (2004) performed a case study on how to teach middle school pupils about Howard Gardner's theory of multiple intelligences (MI). Students' self-identified multiple intelligences profiles appeared to aid them in picking suitable ways to tackle mathematics problems, according to the findings.

Stark (2004) contrasted several cognitive profiles among singers and non-singers in college, with implications for singing teachers. The study found that singers scored much higher in musical intelligence and linguistic intelligence than non-singers. Males outperform females in the areas of logical mathematical intelligence and intrapersonal intelligence. According to the mean scores, female spatial mean scores increased with age whereas male spatial mean scores decreased. Non-singers had greater interpersonal mean scores as they got older, but singers had higher intrapersonal mean scores as they got older.

Thomsen (2004) investigated theory-practice links, especially the meditation technique used in Howard Gardner's Multiple Intelligence (MI) theory implementation in the classroom. The goal of the research was to better comprehend the complicated process in order to gain a better grasp of the nature of theory application and to investigate ways to enhance the ties between theory and



practise. The findings revealed that application theory was a large undertaking that was highly dependent on the situation. Several parallels between the use of multiple intelligences in various circumstances developed. Because of the notion, teachers in many nations acquire similar attitudes and beliefs about human intelligences and instructional practise.

Wood (2004) discovered significant relationships between student satisfaction with web-based technologies, principles of good practise, and multiple intelligences / learning styles in a study on students' perceptions of web-based technologies, principles of good practise, and multiple intelligences / learning styles. Syllabus, diary, file exchange, multimedia, and home page elements earned higher ratings than discussion board, course information, e-mail, web links, and announcement features.

In a study of 103 instructors, **Rondinaro (2004)** looked at the impact of interpersonal multiple intelligence on the use of cooperative learning teaching approaches. There was a substantial mean difference in teachers' attitudes toward cooperative learning across elementary, middle, and high school teachers, according to an analysis of variance.

Abhilash and Annaraja (2005) did research on college students' awareness of biotechnology and multiple intelligences. According to the data, 17.7% of students had a high degree of biotechnology knowledge, and 14.3% of college students had a high level of multiple intelligences awareness. It also showed that there was no link between biotechnology awareness and logical-mathematical, visual-kinesthetic, or musical-rhythmic intelligence. However, there was a link between biotechnology knowledge and college students' verbal-linguistic, interpersonal, and intrapersonal multiple intelligences.

Elliott (2005) found a link between multiple intelligences teaching techniques and student success indicators in secondary school classrooms in his research. He concluded from the study that (i) there is a very limited amount of research focusing on the relationship between MI instructional approaches and student achievement indicators in secondary school classrooms, (ii) MI instructional approaches vary in methodology and implementation but demonstrate a fairly consistent philosophical approach, and (iii) the studies included in this research synthesis failed to prove causation in the relationship between MI instructional approaches and student achievement indicators.

David (2005) identified the causes of gifted females' reluctance to demonstrate verbalization skills comparable to their male counterparts and developed strategies to promote increased female verbal participation in classroom discourse in his study on increasing verbal participation of gifted females through the use of multiple intelligences theory. Female learners had a higher rate of verbal involvement, according to the observational sheets. The frequency of self-initiated speaking and replies to higher-level enquiries, on the other hand, did not grow to the level predicted by the author.

Abigail (2006) investigated how multiple intelligence and empathetic intelligence theories were articulated through instructional theatre on instructors. Multiple and empathetic intelligences were articulated through instructional theatre in a variety of ways, according to the findings. Whether or not the teachers deliberately designed with multiple and empathetic intelligence in mind, the results were identical for both units. Drama combines the intelligences, according to the professors. They also used the intelligences as a model in their teaching.

Gopalakrishnan (2006) discovered a link between multiple intelligence and natural science secondary teacher education students' mastery of content pedagogy. The study's main findings demonstrated that there was no significant association between multiple intelligence and secondary teacher education students' mastery of subject pedagogy of natural science.

Chain (2006) performed research in Hong Kong on male and female Chinese gifted students' perceptions of multiple intelligences: The structure of the student multiple intelligences profile. Using the Student Multiple Intelligence Profile, the researchers looked at the structure of perceived multiple intelligences of 1464 Chinese gifted kids. The findings showed that the structure of perceived multiple intelligences, including the number and character of dimensions as well as the structural link among the eight intelligences tested, was substantially identical for boys and girls. Following that, a second-order confirmatory factor analysis done independently for boys and girls revealed that both boys and girls may view the eight intelligences as belonging to the broad category of personal intelligences or one of the non-personal intelligences.

On the subject of respiratory systems, **Koksal (2007)** performed experimental research to assess the influence of multiple intelligences theory-based training on attitudes about the course, academic accomplishment, and teaching persistence. The study used a sample of 50 X grade high school students (25 experimental and 25 control). Multiple intelligence-based instructions had a statistically significant effect on students' academic success and the permanence of the teaching process when compared to the traditional approach, but no significant effect on students' attitudes toward the course when compared to the traditional approach.

Douglas, Burton, and Durham (2008) examined the impact of the multiple intelligence teaching technique on eighth-grade mathematics students' academic progress. According to the findings, there is a possible link between the employment of multiple intelligences tactics and increased academic accomplishment.

Kirtika et al., (2009) did research on multiple intelligences in young adolescents who were low learners. A hundred students aged 12-14 years old with an IQ of 76-89 were chosen from the specified schools and tested for multiple intelligences. The findings found that, with the exception of musical, naturalistic, and mathematical intelligence, more than 60% of young adolescents had below average intelligence in most elements of multiple intelligences. In interpersonal, linguistic, and existential intelligences, more than 75% of the teenagers scored below normal, with just around 20% scoring above average in these areas.



Santhini (2009) found no significant difference in the mean scores of males and females on achievement motivation, multiple intelligences, and academic accomplishment in a sample of 300 higher secondary students. However, there was a considerable variation in accomplishment motivation, multiple intelligences, and academic success depending on the location, religion, and kind of management. There was also a link between achieving motivation and academic success, as well as multiple intelligence and academic success.

Sujala's (2010) research looked into how parents see their children in terms of various intelligences. A total of 100 excellent scholars were included in the sample. The study employed a Multiple Intelligence Rating Scale to assess various intelligences. Correlation analysis was performed on the summated scores in eight areas. There were very high connections between linguistic and intrapersonal intelligence as well as no significant correlations between linguistic and interpersonal intelligence.

Ogbuanya (2010) investigated the impact of multiple intelligences-based instructional techniques on the cognitive success of technical college students. The study's sample included 308 second-year students from four technical institutions. Conventional Lesson Plan (lecture), Multiple Intelligence Lesson Plan, Electronics Achievement Test (EAT), and MI Inventory were utilised to collect data. Students who were taught using the MI technique scored higher than those who were taught using the lecture method.

Farzana (2010) investigated at 300 higher secondary students' adaptability, multiple intelligence, and academic success. Male and female pupils did not differ substantially in their adaptability, multiple intellect, or academic success, according to the data. Also, there were no significant differences in their respective factors between urban and rural school students; government, aided, and matriculation school students; Hindu, Christian, and Muslim students; scheduled caste, backward caste, and advanced caste students. There was no significant connection between adjustment and academic success.

Gowen (2010) uses webquests to investigate the relationship between motivation and varied intelligence preferences and achievement. The purpose of this study was to see if webquests, an inquiry-based teaching technique, were effective in integrating technology into the curriculum for all students. The study's main findings demonstrated that there was no link between various intelligence preferences, motivation, and achievement.

Shini (2010) showed that students' self-esteem did not differ statistically depending on gender, region, kind of school, religion, or community in her study on multiple intelligence, emotional stability, and self-esteem on a sample of 280 higher secondary students. Male students scored higher on multiple intellect, emotional stability, and self-esteem than female students.

Pre-service mathematics teachers' cognitive domains and learning styles, as well as their perspectives on mathematics education, were studied by **Ozgen, Talaroglu, and Huseyin (2011)**. Data was obtained from 243 pre-service mathematics teachers using the Multiple Intelligence Inventory for Educators and the Learning Style Inventory. The study found that pre-service teachers' major intelligence areas were logical-mathematical and visual-spatial.

Studies Related to Academic Achievement

Lalithamma (1975) examined at some of the characteristics that influence secondary school students' mathematical achievement. The research included 732 students in grade IX who were chosen at random from a stratified sample. Standardised Achievement in Mathematics, a Study Habit Inventory, an Interest Inventory, a Socio-economic Scale, and Raven's Standard Progressive Matrices were among the tools employed. The findings revealed that (i) the average mathematics performance of students was 23.14, with a standard deviation of 8.20, and the distribution was negatively skewed; (ii) there was a significant difference in mathematics performance between boys and girls, with the difference favouring boys; and (iii) In mathematics, urban students outperformed rural students; (iv) Intelligence and interest in mathematics were higher in boys and urban students than in their counterparts; (v) Math achievement was positively related to intelligence, interest in mathematics, study habits, and socioeconomic status; (vi) Studying lessons daily, studying mathematics by writing, repetition in learning, spaced learning, overlearning, and other factors influenced math achievement; (vii) Mathematical achievement was impacted by private tutoring, electric lighting, and study radio equipment, among other factors.; (viii) First-born students performed better than last-born pupils, and (ix) scheduled caste and tribal pupils performed lower than the overall sample.

Zacharia (1977) investigated the effects of attitude and interest on secondary school students' social studies success. The sample was made up of 800 students from different schools in Kerala's Alleppey revenue district, who were chosen using a proportional stratified sampling procedure. Standardised Achievement Test in Social Studies for Standard X, Attitude Scale, Interest Inventory, and Standard Progressive Matrices were among the instruments utilised. The study's main findings were: (i) There was a strong positive correlation between secondary school pupils' achievement in social studies and their attitude; (ii) The pupils' interest in social studies was closely related to their achievement in the subject at all levels; (iii) The pupils' intelligence was a major factor in influencing their achievement in social studies; (iv) The students' attitude and intelligence scores were almost similar in relation to their social studies success; and (v) the students' intellect was not a significant factor in determining their attitude and interest in social studies.

Dixit and Santosh Kumar (1980) investigated the impact of personality traits and self-perception on academic success. The sample consisted of 500 B.A. Part I undergraduate students from Agra City who were chosen at random. Cattell's 16 PF Questionnaire, Group Test of Intelligence, and Dixit and Srivastava's Self-concept Test were employed as tools for data collection.



The study found that (i) personality variables affected educational accomplishment considerably; (ii) intelligence was associated to educational achievement; and (iii) self-concept was not related to educational achievement.

Murnane (1985) found that increased student achievement is related to both the knowledge gained via continuing professional development (which may represent more recent breakthroughs in the knowledge base) and the teacher's desire for learning.

Gaddy (1986) investigated that watching television lowers high school pupils' academic achievement. According to the findings, there is a considerable negative link between TV watching and academic achievement.

Walberg et al. (1986) studied the determinants impacting 17-year-old students' academic achievement using data from a nationwide sample of 1955. Academic achievement appears to be linked to ability, motivation, and the quantity of homework assigned, as well as the school and class environment, family environment, sex, and race.

Sandhu (1986) investigated the notion that pupils from Scheduled Castes, Backward Classes, and the General Category do not vary in intellect or academic achievement. The Culture Fair Intelligence Test scale 2 was given to 175, 15-year-old children, and their school records were checked for achievement in Mathematics, Science, English, Punjabi, and Hindi. There were no significant changes in academic success, according to the findings.

Singh (1986) investigated at how gender affected school performance in 30 high school males and 30 high school girls. When comparing the marks of boys and girls on their final exams, it was discovered that the girls had much greater academic achievement.

Fehrmann et al. (1987) investigated the role of parents in their children's academic progress. A longitudinal study of 28,051 high school students showed that parental participation has a beneficial impact on children' academic achievement.

The impact of television watching on academic success is a hotly debated issue with a wide range of results. **Potter (1987)** conducted research on the association between exposure to various sorts of television programmes and academic achievement. A survey of 543 students in grades 8 to 12 responded to questionnaire. The findings found that watching TV has no negative impact on achievement until it surpasses roughly 10 hours per week.

Foon (1988) investigated the impact of a mother's job situation on adolescent academic achievement. A questionnaire was completed by 896 male and 779 female 10th grade students to analyse the impact of their mothers' and fathers' work status on their self-perceptions and academic achievement. Females' mother's job position was connected with a preference for mathematics courses and a positive attitude toward performing well in school, but males' mother's employment status was associated with a low choice for scientific subjects. Males whose mothers worked in low-status jobs preferred less for mathematics subjects than the males whose mothers worked in high-status jobs.

According to **Kudrek and Sinclair (1988)**, family structure, gender, and family environment have an impact on academic achievement. The subjects were 219 eighth-grade students from a middle-class family. It was discovered that pupils from two-parent nuclear homes performed better academically than children from other family structures.

Simmons and Wade (1988) investigated how various countries perceive learning and education. Recent research uncovered some fascinating data about the attitudes of British and Japanese students toward education. According to a poll of Japanese and British students, studying, passing exams, and entering high school are of paramount significance to Japanese students, but many English students are more concerned with finding employment. It was also revealed that the Japanese placed a greater focus on principles like as compassion and regard for others, whilst the English placed a greater premium on qualities such as individuality and parental love. It is claimed that young people's academic achievement in Japan stems from a widespread regard for learning, as well as a conviction that success or failure is determined by individual effort rather than one's social status.

Gawande (1988) investigated the relationship between achievement motivation and scholastic success in Class IX pupils. The information was gathered from six junior colleges in the Maharashtra district of Amaravati. Rao's Achievement Motivation Test and Scholastic Achievement Tests were among the tools employed. The study found, among other things, that: (i) The association between achievement-motivation and school performance was stronger among urban pupils than among rural students; (ii) The coefficient of connection between achievement-motivation and scholastic achievement of non-backward and backward pupils was not significantly different; (iii) Boys were more driven by achievement than girls; and (iv) There was no significant difference in scholastic achievement scores between boys and girls.

Ramaswamy (1988) investigated the factors that influence achievement. 72 pupils from Class X from 20 schools in the Madurai Revenue District were chosen as the sample using a stratified random selection approach. SSLC Public Examination, Sharma, C.P.'s Personality Adjustment Inventory, Rao's Achievement Motivation Test, and Mukta Rani's Self-concept Scale Patel, B.V.'s Study Habit Inventory and Singh, R.A. and Saxena, S.K.'s Socio-economic Status Scale (Tamil version) were used as tools to collect relevant data. The study found that: (i) academic achievement was positively related to personality, achievement-motivation, self-concept, study habits, and socio-economic status among high and low achievers; and (ii) significant differences in personality, achievement-motivation, self-concept, study habits, and socio-economic status were found between high and low achievers.

In an attempt to determine the efficiency of a behavioural programme for improving academic performance on a sample of 143 students, **Kamalanabhan (1988)** discovered that a behavioural programme consisting of relaxation, assertiveness, and study skills training improves students' academic performance.



Jayaraman (1989) looked at some of the factors that influence students' mathematical performance in standard X. For the final research, 383 students (10 percent of the population) from 16 high schools and upper secondary schools in the Devakottai Educational District were chosen. The schools were divided into two groups: those that were aided by the government and those that were run by minorities. When selecting the sample, urban, rural, boys, girls, and co-educational schools were all taken into account. Quilter's Likert type five-point scale was used to assess the pupils' attitudes about mathematics. The Scale of Obstacles to Mathematical Achievement was employed. The degree of achievement was measured using an achievement test. The data was analysed using the mean, SD, t-test, and chi-square test.

The study's main results were: (i) there was a relationship between attitude and achievement towards mathematics; (ii) There was a negative connection between hindrances for pupils studying mathematics and their attitude toward the subject.

Barnes and Nagarkar (1989) examined the effect of yoga instruction on academic achievement in a group of 40 eighth-grade students aged 13 to 14. They received four months of yoga instruction. Before and after training, a scholastic aptitude exam and a nonverbal intelligence test were administered. The findings demonstrated that yoga practise had a significant favourable impact on academic success as well as IQ. Academic success is influenced by the type of family environment one has. Working and non-working mothers create diverse surroundings in this context, impacting academic attainment in different ways.

According to Armour Thomas et al. (1989) when student attributes are maintained constant, the association between teacher qualification and student achievement becomes much more evident. Differences in teacher qualification (educational degrees, certification status, and experience) accounted for approximately 90% of the total variation in average school level student achievement in reading mathematics at all grade levels tested, as per a study of high and low-achieving schools in New York City with demographically similar student populations.

To test the hypothesis that authoritative parenting facilitates school success, Steinberg et al. (1989) glanced at the long-term relationship between three aspects of authoritative parenting (acceptance, psychological autonomy, and behavioural control) and school achievement in 120 families with a first-born child aged 11 to 16 years. The findings demonstrated that authoritative parenting helped adolescent academic achievement. Each component of authoritativeness contributed to achievement in its own way. Students who reported their parents as treating them kindly, democratically, and firmly had more positive views regarding their achievement and performed better in school.

Bisnaire (1990) used questionnaires to study 77 children of divorced parents. Following the separation of their parents, 30% of the children saw a significant drop in their academic performance. Access to both parents was linked to improved academic performance. Mothers with a greater level of education had better psychosocial home settings and performed better academically.

Budhdev (1990) studied the academic achievement of working and non-working mothers of secondary school children. A total of 307 boys and 343 girls from working mothers and the same number of boys and girls from non-working mothers were included in the sample. Academic achievement results were gathered from each school's annual report card. The scholastic success of children of working mothers was shown to be higher than that of children of non-working mothers.

Ngailiankim (1991) studied a few variables that are linked to mathematics achievement. A total of 303 individuals representing 163 boys and 140 girls were chosen as a sample for the study from the population of all class X students studying in central schools in the states of Nagaland, Meghalaya, and Manipur. Achievement Test in Mathematics, Attitude Scale to evaluate attitude toward mathematics, Educational Aspiration Scale of Sharma and Gupta, Occupational Aspiration Scale of Grewal, Differential Aptitude Test, and Cattell's 14 High School personality Questionnaire (HS PQ) were the tools employed. The data was treated using descriptive statistical techniques such as the chi-square test and the contingency co-efficient.

The study found that: (i) there was a significant relationship between (a) attitude toward mathematics, (b) educational aspiration, (c) numerical ability, (d) abstract reasoning, (e) personality factor A, and (f) personality factor G and mathematical achievement; and (ii) none of the other variables studied had a relationship with mathematical achievement.

Kundu and Basu (1991) studied 100 boys and 100 girls between the ages of 8.5 and 13.5 years old. The Rosenweig P-F research (Children's form) and the junior Eysenck personality assessment by Eysenck (1975), was used in India by Kundu, to investigate aggressive reactions to frustration (1976). Academic achievement in school children is connected to and can be effectively predicted from the child's method of dealing with frustration-induced anger, according to the study. Children who excelled in school were less hostile than those who did not.

Brook (1991) evaluated 168 Israeli high school pupils' performance. Sixty-eight percent of mothers worked outside the house, with 42 percent working full-time and 58 percent working-part-time. There were no significant disparities in achievement between working and non-working mothers' children. There was a considerable gap in achievement between pupils from low-income families and those from higher-income ones.



On a sample of 28,051 high school students, **Cool and Keith (1991)** investigated the direct and indirect effects of quality of teaching, motivation, quantity of academic course work, and homework on academic achievement. Ability, academic course work, and instructional quality all had a significant impact on school learning, a result that supports their inclusion in popular school learning theories.

Cherian (1992) looked into the relationship between parental education and academic achievement in 369 male and 652 female adolescent pupils from rural areas of South Africa. The data was gathered via a questionnaire. Academic achievement and parental education were found to have a beneficial relationship.

Rosaly (1992) discovered that high school students' attitudes toward mathematics learning and their mathematical achievement are substantially associated, and that urban boys and girls had a more favourable attitude toward mathematics than rural boys and girls.

Mazumdar (1992) investigated the relationship between students' attitudes toward English and their English achievement in Standard IX. A stratified random selection strategy was used to pick 500 students in Standard IX from 10 high schools in Guwahati City for the study. An English Achievement Test for Class IX pupils and an Attitude Scale were employed as tools. According to the findings of the study: (i) there were statistically significant differences in achievement and attitude scores between students attending government and private schools, with the latter group of pupils scoring higher. (ii) there were no significant differences in achievement and attitude ratings between boys and girls; and (iii) The whole sample's co-efficient of correlation between English achievement and attitude toward English was positive.

A sample of 185 students in 9th, 10th, and 11th grades were studied by **Bhatnagar and Sharma (1992)** to see if there was a connection between parental education and academic achievement. Trivedi and Udai Pareek SES scan was used to measure the degree of parental education. The average of the student's final examination grades was used to determine academic achievement. The results showed that children with educated parents scored much better academically than their peers.

Keith (1993) studied the impact of parental participation on eighth-grade students' achievement. The researchers looked at data from 21,814 students and their parents who took part in the National Educational Longitudinal Study. The findings revealed that parental participation in their children's academic lives had a significant impact on their achievement in eighth grade.

Bogensneider and Steinberg (1994) investigated if and how parental work influences high school students' academic achievement. There were 2,571 white teenagers living in two-parent families who supplied information on parental job patterns, school grades, and family factors. According to the findings of the study: (i) When their mothers worked full-time, upper middle-class and middle-class boys reported poorer grades; (ii) Although upper middle-class and middle-class girls reported no effects from their mothers' employment, they did report poorer high school grades when their mothers worked full-time during the pre-school period. (iii) Both current work and employment throughout the pre-school years were related to poorer grades among upper middle-class boys; and (iv) When upper middle-class boys' mothers worked full-time throughout the boys' lives, their grades were poorer than when the mothers gradually increased their work hours.

On a sample of 1659 male and 1801 female students, **Borg (1995)** evaluated the effects of age and sex on performance. According to the study, older pupils were more effective, and their proportion dropped as they became older. Girls outpaced boys in terms of academic performance.

The research of **Downey (1995)** indicated that larger isn't necessarily better. The number of siblings and academic achievement were investigated in a sample of 24,599 eighth graders from the 1988 National Education Longitudinal Study. It was discovered that the number of siblings had an inverse relationship with academic achievement.

Undheim (1995) investigated at sex disparities and the impact of parents' education on high-ability students' achievement. Data on students' academic success was gathered from school records. In the high ability group, parental education was associated with achievement, implying that parental education's support and modelling effect are significant for achievement.

Gyanani (1995) used a sample of 415 high school-students to study the impact of peer tutoring on achievement. Standardised verbal and nonverbal IQ tests, as well as self-made assessments, were employed as tools. As per the findings students' academic achievement is improved by using the peer-tutoring approach.

Pathak and Verma (1995) investigated the relationship between academic achievement and creativity. A total of 200 male pupils from class ten were included in the study. As a tool, the Wallach-Kogan battery of creative instruments was employed. The grades earned in school were used as a benchmark for academic performance. According to the findings, high creatives have excellent academic achievement.

Vijayalakshmi (1995) analyzed at how schedule caste, backward community, and general candidates performed academically. The school used 150 pupils from class X as a sample. The sample was drawn using the incidental-cum purposive approach. The school



achievement was calculated based on the pupils' performance in the school exams. The results revealed that the academic achievement of general candidates, backward caste students, and scheduled caste students differed substantially.

Research on the relationship between IQ and achievement was carried by **Suji Kumar (1996)**. According to the findings, there is a positive substantial association between intelligence and mathematical achievement.

Tiwari (1996) investigated the degree of adjustment of high and low achievers in many domains such as family, health, school, social, and emotional adjustment. From 10th grade, Kumar's Adjustment Inventory was given to 50 high performers and 50 low achievers. High-achieving adolescents had better home, social, and emotional adaptations than low-achieving adolescents, according to the test.

Alishie (1996) investigated the correlation between extracurricular activity involvement and characteristics including school attendance and academic achievement. The sample for this study consisted of 575 students from 13 high schools. A survey tool was used to poll a group of people. The findings revealed a link between participation in extracurricular activities and both school attendance and academic achievement.

Ortiz (1996) performed research on the difficulties, concerns, and coping strategies of high school students. A total of 94 students from grades X, XI, and XII were studied. An open-ended questionnaire was used to gather data. The issues that were encountered and the manner in which they were dealt with were investigated. The findings revealed that this group's biggest concern was their academic performance. **Jyothi (1997)** discovered that there is a link between creativity and mathematical achievement.

Khare and Grewal (1997) analysed the academic achievement and creative ability of children in urban and rural regions who attended formal primary schools and non-formal education centres. A total of 838 pupils from formal and non-formal education centres were chosen at random. The Torrance Test of Creative Thinking, as well as achievement exams, were given. The findings indicated that the type of school has a substantial impact on academic achievement.

Krupa (1998) discovered a link between cognitive activities and achievement in physics were both positive and substantial. **Beal (1998)** contrasted student-athletes' academic performance to that of non-athletes. Academic achievement was assessed based on the results of prior examinations. The study discovered that student athletes outperformed non-athletes in terms of academic achievement. The association between disruptive behaviour, attentiveness, and academic success was investigated by **Hartley and Melinda (1998)**. Individually administered standardised achievement exams were used to assess academic success in reading and mathematics. Teacher evaluations on the Learning Problems Scale were used to assess learning issues. A total of 155 children were included in the study, who were sent to a psycho-educational clinic. The findings indicated that disruptive behaviours are not good predictors of academic achievement, but overall intelligence assessments are.

Kim (1998) investigated the relationship between teenagers' views of parental warmth, control, and engagement in their education and academic achievement. The mother and father versions of the Child Parental Acceptance-Rejection/Control Questionnaire, as well as the Family Information Sheet, were given to a group of 245 students. The majority of adolescents viewed their mothers and fathers as warm and interested in their education, according to the report. The findings demonstrated that teenagers' academic achievement was positively influenced by perceived parental behaviour.

Forbes and Baker (1999) studied the effect of classroom organisation on academic achievement. Sample consisted of 100 students, of whom the control group was placed in traditional single grade classrooms and the experimental group was placed in multi-grade classrooms for three consecutive years. Students' scores on assignments were collected. Metropolitan achievement tests, ERB comprehensive testing program, two sub-tests in reading comprehension and mathematics were conducted to determine, if any, significant differences occurred in academic achievement between the two groups. The findings showed that there was a statistically significant difference favouring multi-grade boys on mathematics achievement over single grade boys.

Grinion (1999) examined the relationship between family socioeconomic status and academic achievement. The data were collected from high school students from four schools. Information pertaining to students was obtained from students' personal files. The researchers concluded that there is an academic achievement gap between children from low-income homes and their more advantaged peers. A strong relationship between poverty and academic achievement was found. Further it was concluded that poverty had more deleterious effects on boys' academics achievement than on girls' academic achievement.

Gertz and Lee (1999) examined the relationship between gender, race, SES and academic achievement and found out that race and gender contribute to the proportion of variance in academic achievement and SES plays the largest role. **Tucker and Delano (1999)** conducted a study to examine the effect of inter-scholastic athletic participation on academic achievement. Students' records and 17 item athlete's questionnaire was used to collect the required data. The study revealed that students who participated in inter-scholastic athletics had higher grade point averages than the general student population.

Kochurani (1999) showed that the thinking operations in mathematics of IX standard students were positively related to their achievement in mathematics. **Sharma and Kumar (1999)** studied the relationship between birth order and intelligence in Indian setting. First three born school going children randomly selected from 40 urban educated families formed the sample. I.Q. was measured using measured using Raven's Advanced and Colored Progressive Matrices. Findings revealed that third born males are more intelligent than second born males and boys are more intelligent than girls.



Jyothi and Ramakrishnaiah (2000) conducted a study to explore the extent of relationship between scholastic achievement and academic adjustment. Data were collected from 300 intermediate students. Rao's Academic Adjustment Inventory was used as the tool. The results revealed that academic achievement was higher among those having higher academic adjustment and academic adjustment positively influenced academic achievement.

Raj and Sreethi (2000) studied academic achievement as related to procrastination behaviour and study habits. Sample consisted of 166 male and 134 female government and private higher secondary school students in Tamil Nadu. The inventory developed by Sananada Raj was used to measure Results revealed that procrastination and study habits. Results revealed that procrastination behaviour led to improper study habits which further lead to lower academic achievement. Differences in procrastination behaviour, study habits and in turn academic achievement were observed among students of government schools and private schools. **Patil (2001)** showed that the effect of logical thinking operations mic achievement in mathematics is more in girls than in boys.

Conclusion

The review of related literature presented in here contained theoretical details related to multiple intelligence and academic achievement and also the research conducted in this area. The investigator revealed so many studies, which included both Indian and foreign studies.

The theoretical overview included definitions, theories, and other explanations of the relevant variables giving emphasis to Gardner's views. With regard to the researches on multiple intelligences it may be point out that more studies were conducted abroad. Most of these studies (Scott, 1996; Malm, 2001; Priviti, 2003) used students as sample and standardized tests like Teele Inventory of Multiple Intelligence and multiple Intelligence Development Assessment Scale (MIDAS) for measuring each of the multiple intelligences and variables related to academic achievement.

The investigator also found that some studies (Rockwood, 2002; Trujillo, 2003; Krishna, 2004) establishing the relationship between multiple intelligences and its components with variables like achievement in mathematics, proficiency in language, reading achievement, gifted identification program, self-efficacy, method of teaching etc. Most of the studies (Elliot, 2005; Koksai, 2007) focused on 2007) focused on multiple intelligence-based stud instructional approaches. In some of the studies multiple intelligence is related with the variables such as technology (Dome, 2004), web-based technology (Wood, 2004), biotechnology (Abilash, and Annaraja, 2005) computer programming website usability and instructional technology CONI more, 2003). But the studies which relate all the components of multiple intelligence with the achievement in general school subjects were found to be scanty. Hence, it is hoped that the present topic under study can explore more information in the field of multiple intelligence and academic achievement, because the investigation is carried out.

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A REVIEW ON IMPLEMENTATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) AND 21ST CENTURY SKILLS IN EDUCATION AND RESEARCH

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Abstract

In the last five decades, education institutions have risen at an exponential rate to fulfil the need for high-quality education for all. Due to rapid improvements in Information and Communication Technology, this component has received even more traction (ICT). This study focuses on the role of information and communication technology (ICT) and 21st century skills in education and research in India in the twenty-first century. In the twenty-first century, the increased use of information and communication technologies (ICTs) has changed teaching and learning at all levels of higher education systems (HES), resulting in quality improvements. Online and virtual environments are rapidly being used to replace traditional teaching and learning methods. With the incorporation of ICT into the educational system, the possibilities are unlimited. The use of ICT in education not only enhances classroom teaching and learning, but it also allows for e-learning. In the twenty-first century, ICT has aided distant learning. Rather than gaining computer skills and purchasing software and equipment, successful adoption of ICT to lead change is more about inspiring and empowering teachers and supporting them in their interaction with students in learning. In the twenty-first century, ICT-enabled education will eventually lead to democratisation of education. The adoption and use of information and communication technologies (ICTs) in education has a favourable influence on teaching, learning, and research. ICT has the potential to change the way education is delivered and to provide more people with access to it. It will also improve flexibility, allowing learners to access education regardless of time or location in the twenty-first century. Similarly, more access to best practises and course materials in education, which may be shared via ICT, can promote better teaching and student academic attainment. According to the literature, successful ICT integration in education in the twenty-first century is possible.

Keywords: 21st Century Skills; Information and Communication Technologies (ICT); Higher Education System; Moodle

INTRODUCTION

Education has witnessed a paradigm shift as a result of tremendous developments in information and communication technologies (ICTs). Information and communication technology have endowed society with a huge array of new communication possibilities during the last several decades. People can use technologies like instant messaging, voice over IP (VoIP), and video conferencing to connect with colleagues in other countries in real time. Facebook and other social networking sites allow people from all over the world to stay in touch and connect on a daily basis. Online learning platforms like Massive open online courses (Moocs), modular object-oriented dynamic learning environment (Moodle), videoconferencing, virtual laboratories, screencasts, e-mail, forums, search engines, blogs, podcasts, vodcasts, wikis, high-tech 3D graphics, e-Groups, learning dialogue videos, learning-by-doing videos, digital game/toy-based learning, and flipped-classrooms associated with active learning pedagogy are based on Blended learning which is in reality, a requirement of the 21st century.

Information and communication technology (ICT) is a type of technology that facilitates information-based activities. Data collection, processing, storage, and presentation are examples of such tasks. Collaboration and communication are becoming increasingly important in these operations. As a result, IT has evolved into ICT, or information and communication technology.

ICT is an umbrella term that includes any communication device, encompassing radio, television, cell phones, computer and network hardware, satellite systems and many more things.

USE OF ICT IN EDUCATION

The Education industry is being confronted with several issues nowadays. We live in a world where everything is always changing. The corona pandemic is the most recent example. Who thought anything like this could happen? The world has altered because of Covid-19. Due to the lockdown, everyone is working online from home. Students, instructors, and everyone else is working hard to keep learning going.

This pandemic has ushered in a new learning model for people: online learning. From the moment we get up until we go to sleep, we are surrounded by media such as newspapers, radio, television, and computers. As a result, in today's changing culture,



becoming tech-savvy and utilising information and communication technologies is critical. Our education system would thrive if we employ and accept ICT in classrooms, and the country will become a knowledge superpower.

The following are the three obstacles that people experience when utilising ICT tools:

1. Access
2. Equity
3. Quality

Now, even schools are utilising ICT to provide knowledge and information to students. The use of information and communication technology (ICT) has become an integral part of the teaching-learning process. It has switched from blackboards to whiteboards and adopted the use of a digital smartboard in the classroom.

Teachers who are tech-savvy and appropriately educated in the use of these technologies give better knowledge and high-order thinking abilities to their students.

Why introduce ICT in education?

Technology tools such as television, radio, computers, the internet, and cell phones all play a significant role in our lives. People utilise information and communication technology (ICT) to stay connected and adapt to it. ICT is an integral aspect of our life and has radically revolutionised it. Mobile learning (m-learning) - a type of e-learning, which is a growing trend where education has transcended the physical limits of classrooms and gained mobility. Students have access to information at any time and from any location, and the number of institutions that provide such advanced technical terrains is growing by the day.

According to Cross and Adam, the four key variables responsible for implementing ICT in education, are as follows:

- 1) Social: Technology has a significant impact on society. Students must be educated about technology and encouraged to aspire to become tech-savvy.
- 2) Vocational: Nowadays, many occupations are technology-based.
- 3) Catalytic: The use of technological tools to improve the teaching-learning process.
- 4) Pedagogical: Using technology and ICT technologies to improve learning, flexibility, and efficiency in the knowledge dissemination process.

ICT in Teaching

Improved student learning and teaching methods may be achieved via the use of information and communication technology. In subject areas such as Mathematics, Science, and Social Studies, a report published by Japan's National Institute of Multimedia Education (NIME) found that increasing student exposure to educational ICT through curriculum integration has a significant and positive impact on student achievement, particularly in terms of "Knowledge Comprehension," "Practical skill" and "Presentation skill". Teachers can simply convey difficult instructions and guarantee that pupils understand them using ICT. It is frequently connected with advanced technology. However, traditional technologies such as radio, television, and the telephone are included in ICT. In today's networked culture, technology is frequently mixed, and we utilise various technologies at the same time. To communicate with persons who may be in various geographical areas, we employ satellite, internet, and video conferencing technologies. The influence of location, time, and distance can be reduced through the use of ICT.

Teachers must start rethinking how they address children's learning needs and how they adapt curriculum to the demands of human intellect. The Internet may be a great technique to tailor information to human information processing characteristics. Lectures, books, and conference papers are examples of traditional means of knowledge transfer that follow a linear development of information. Human minds are more adaptive than this, employing nonlinear problem-solving, representation, and information storage and retrieval mechanisms.

Teachers must participate in continual training in order to become confident users of ICT in the classroom. Teachers should be aware of the advantages of digital literacy. ICT training must be recognised as a requirement for teaching such abilities, as well as a facilitator of other teaching and learning approaches.



ICT as A Current Thinker and Adapter

The following are three ways in which ICT might be perceived as a valuable educational tool:

1. ICT training
ICT education entails the use of skilled employees who can satisfy the requirements of society and successfully provide information. The goal is to teach individuals and provide pupils with ICT knowledge and skills.
2. ICT-assisted learning
Multimedia education is another name for it. Many institutions and universities employ ICT resources for printed study materials all around the world. It comprises radio, television, audio-visual assistance, and other forms of broadcast media.
3. ICT-enabled learning
Content is delivered by ICT technologies in ICT-enabled education. ICT is viewed as an essential medium for the teaching-learning process.

Objectives of ICT usage in Education

These objectives include:

- Making education more accessible through the use of the internet.
- Improving the quality of education, particularly in rural regions.
- To make the educational system more transparent.
- To improve the school system's policies, rules, and laws.
- To assess and evaluate the efficacy of students' learning and involvement.
- Students' conduct, engagement, and retention in the learning process are measured and evaluated.
- Analyse students' performance, placement, and knowledge application.

The Importance of Students Engaging with ICT

ICT should be used by students in order to:

- Cultivate 21st-century skills, such as ICT literacy and competency.
- Increase retention capacity and rates.
- Prepare them for an interconnected society that takes use of technological advancements.
- Adapt ICT tools as a lifetime collaborator.

The Importance of ICT in Education

➤ Online education

The development of ICT and its tools resulted in the rise of online teaching-learning. Teachers and students alike are discovering new ways to approach the educational process as a result of this. During the corona epidemic, online learning has grown in prominence as a way to keep learning going. ICTs have ensured that education reaches all corners of the globe, even rural locations. It has guaranteed that every learner reaps the benefits, regardless of where they are.

➤ Accessible to all

ICT in education allows all sorts of students to participate. The materials offered may be used by all pupils to learn. Even pupils with unique needs can profit from it if they use it properly. ICT has also addressed issues such as the "digital gap," allowing even the most disadvantaged persons to get access to the resources they need for their educational needs and to improve their learning.

➤ Skills development and higher-order thinking

High-order thinking and reasoning skills are aided by the use of information and communication technology. Evaluation, planning, monitoring, managing, reflecting, and other processes were made possible by these abilities. To make successful use of ICT technologies, one must be able to explain and justify issue solutions. Students should be able to talk about, test, and evaluate the tactics and approaches they employ while utilising ICTs.

➤ Enhances Subject learning

ICT's primary purpose is to improve topic learning and skill acquisition. It encourages important reading and numeracy skills.

➤ Improved ICT literacy and capabilities.

The 21st-century skills that are required include literacy and capacity. Equipping the subject-matter with meaningful activities is one of the finest methods to build.

➤ Motivates Collaboration

As pupils learn and work together, ICT encourages teamwork. As they discuss, communicate, and study together, it also improves their communication skills. To understand how it works, all you need is a laptop, tablet, or desktop computer. ICT technologies make it possible to develop language through facilitating conversation.



➤ **Promotes learning**

The use of information and communication technology (ICT) encourages youngsters to learn. Technology helps children study more effectively. They get enthralled by technological tools and inspired to study more efficiently in the classroom or at home.

➤ **Increases information retention and engagement**

Children become more interested and demonstrate higher engagement in learning when ICT is integrated into school and its instruments. It's all due to technological advancements. It has made learning more enjoyable by incorporating creativity and games. It benefits learning in a variety of ways. As a result, pupils learn more effectively, resulting in increased information retention.

➤ **With technology, effective differentiation instruction is possible**

In modern culture, there are many different types of learners with different learning styles. As a result, technology takes care of offering differentiated education to various learners.

➤ **A vital component of the curriculum**

ICT has an essential role in the school system, according to the most recent curriculum. As a result, several governments throughout the world have begun to include ICT into their education and curriculum.

➤ **The Knowledge Economy's Rise**

We live in an economy that is hungry for accurate information generation and distribution. ICT is present at all levels and in all sectors, including health, education, the environment, and manufacturing. As a result, its application is required at all levels. As a result, we cannot deny that ICT plays a significant role in our lives. It encourages global collaboration and networking. Technology evolves at a rapid pace. Certain characteristics, such as development, creativity, joy, enjoyment, and consumption, make it appealing.

Educational Benefits of ICT

1. Individualization of Learning:

Learning should be personalised. It implies that people learn as individuals rather than as a collective. As learners are varied, ICTs allow them to learn at their own speed by providing flexibility.

2. Interactivity

Through ICT Learners may learn adequately at any time. They are not required to follow any certain order. ICT tool allows students to study more efficiently.

3. More cost-effective, faster delivery, and a larger reach

ICT tools are more cost-effective, and the speed with which material is delivered is also faster. The number of students grows as a result of ICTs, lowering the investment overhead cost.

4. Diverse audiences and multiple teaching modes

ICT performs a variety of tasks, such as identifying and resolving issues with obtaining information and understanding about various topics. It's also great for drills and practises.

5. Consistent Quality

ICTs operate as a tremendous equaliser by creating uniformly high-quality material for affluent and poor, urban and rural populations. It creates high-quality material for everyone.

6. Encourages collaborative learning.

ICT promotes cooperative learning by promoting interaction and discussions in a more participatory classroom setting.

7. Assist as a motivator

ICT technologies motivate youngsters and urge them to improve their learning. Children are enthralled by technology. Teachers should utilise their abilities to stimulate curiosity, fun, and creativity in order to help students learn more effectively.

8. Insensitive to distance and climate

ICT technologies enable access to anyone, regardless of location or climatic circumstances.

Educational downsides of ICT

1. Too expensive Infrastructure and start-up costs

ICT tools have substantial start-up and maintenance expenses. Hardware and software can be quite expensive. As a result, high prices act as a deterrent to its use.

2. A problem with accessibility

This is the most frequent problem on the planet. Not everyone has the same level of access. Some people may profit greatly, while others may not. The following are some of the most important accessibility factors:

- Electricity
- Broadcast timings



- Poverty
- Illiteracy
- Limitations on time
- Mobility

Accessibility is hampered by these variables.

3. Difficulties in Performance evaluation:

ICTs help to improve learning, which is generally multifaceted and has a long-term purpose. As a result, virtual performance review is more challenging than classroom evaluation, which is immediate.

4. Requirement of Continual training.

Technology evolves at a rapid pace, as does the need for individuals to be trained. Because many educators and teachers are unfamiliar with ICT technologies, they may be unable to deliver updated knowledge, causing learning to be hampered among pupils. As a result, all personnel who will be involved in ICT must be trained.

5. Change in mind set to better comprehend teaching and learning

There is a need to adapt to the varied teaching-learning process in a world with multiple media and instructional techniques. The focus might change from learning to acquiring ICT skills. There is a need for people's attitudes and mind-sets to shift in this way.

Educational Applications of ICT

➤ **One device per child**

➤ **Interactive white boards**

Interactive whiteboards or smartboards can be used to display, modify, drag, click, or copy projected computer pictures. Handwritten notes can be taken and saved for future reference. Instead of being student-centred, it is utilised for whole-class education. ICT has the potential to increase student participation and engagement.

➤ **Smart classrooms**

These facilitate the interactive technological involvement in teaching learning process where interactive whiteboards are used as tools.

➤ **Tablets**

➤ **E-readers**

E-readers can hold thousands of digitalized books. E-readers are popular among students for independent reading. It has a number of characteristics, including portability, extended battery life, text responsiveness, and the capacity to define unfamiliar language or terms.

➤ **Flipped classrooms**

A lecture and practise on a computer anywhere are two aspects of a flipped classroom. For a deeper grasp of the material, it includes computer-guided and interactive learning exercises. The majority of students are pleased about the flipped classroom, although they prefer cooperative learning activities over lectures.

ICT IN RESEARCH

Researchers mostly employ ICT applications for their capacity to leverage the knowledge collecting process and to improve resource creation.

Researcher in general value creativity and originality thus the ICT tools provide with the most open situations with great autonomy to the researcher can really help in identifying and solving research problems in most creative ways.

Today, there are a plethora of ICT tools or apps for collecting research data and information, but the ideal use of ICT tools would be to develop cognitive skills and therefore help discriminate, analyse, and produce information rather than merely collect it.

In general, ICT applications aid researchers in the following research tasks:

- Identify acceptable information sources
- Critically analyse material
- Conduct productive research
- Manage information
- Use information to extend and share knowledge across topic domains
- Select favourite resources and e-journals, store searches and records, and set up email notifications
- Search up to 10 databases and electronic resources at once



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- Receive results in a standard format
- Link to particular databases for more specialised searching
- Save searches and records, and set up email notifications for your favourite resources and e-journals

Implications of ICT on research

The use of ICT has a variety of implications on research, which may be divided into three categories:

1) Information and communication technology (ICT) in pre-data analysis

It consists of a literature review, article availability, article tracking, thesis and dissertation availability, content search, and data collecting.

2) Information and communication technology (ICT) in data analysis

It comprises data analysis, both quantitative and qualitative.

3) Information and communication technology (ICT) in post-data analysis

It includes collection of references and bibliographies, discussion of articles, theses, and dissertations, plagiarism detection, and journal per submission.

ICT & 21ST CENTURY SKILLS

Over the last decade, a growing number of experts from various fields, including education, economics, politics, and international relations, have come to an agreement on a new set of skills that are required to survive in the twenty-first century, as well as on providing learners with alternative learning opportunities to learn more than just reading, writing, and arithmetic. According to the World Bank Group and the Partnership for 21st Century Skills, in order to contribute to the global knowledge economy and be productive world citizens, learners must develop critical thinking, effective communication, teamwork, continuous learning, and technology use skills.

Among the important effects of ICT usage in education are improved school attendance, deeper conceptual comprehension in key school topics, and promotion of wider participation in the development of the community. Similarly, according to SRI International, "allowing youngsters to learn to utilise ICTs and provide them with the best possible chances to build a broad set of 21st-century abilities" are the two primary strategies for promoting 21st-century learning. ICT Integration programmes should be properly planned and provide authentic routes to assist beginner learners in locating information and to learn 21st-century skills.

Students require 21st century abilities in order to increase their achievement and develop cognitive processes and knowledge production that will equip them for future professional success.

Knowledge, life skills, professional skills, habits, and attributes that are vital to student success in today's society, particularly when students move on to college, the workforce, and adult life, are referred to as 21st century skills. The 12 qualities that today's students need to thrive in their careers in the Information Age are known as 21st Century skills. Those twelve 21st Century skills are as follows:

1. Critical thinking
2. Creativity
3. Collaboration
4. Communication
5. Information literacy
6. Media literacy
7. Technology literacy
8. Flexibility
9. Leadership
10. Initiative
11. Productivity
12. Social skills

While 21st-century skills have always been valuable, they've grown much more so in a global economy that changes at a breakneck pace. All of these abilities lead back to a single point of focus. The ability of a person to implement and/or adapt to change. This is due to the fact that education sector might change at any time. New ideas and approaches are routinely disrupting the field of education. With this in mind, the world has entered a period in which nothing is certain. As a result, students must learn to manage the



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change that will inevitably occur in their life. They must, at the very least, learn how to respond to it by adopting 21st century skills. They'll be left behind if they don't.

CONCLUSION

The existing educational system has to be transformed, and significant adjustments must be implemented in order to sustain quality. ICT will serve as a powerful catalyst for a shift in many educational practises. For outcome-based education, a transition from teacher-centred to student-centred classrooms is required. Teachers may use technology to create student-friendly environments for both in-class and out-of-class learning.

Rethinking and redesigning educational structures, procedures, and ICT-based learning pedagogies is long overdue. In fact, researchers are combining cognitive capabilities with Internet of Things technology to provide individualised learning aids for students and instructors. With a major overhaul of the educational system on the horizon, teachers must be trained in the use of ICT tools as soon as possible.

In this context, the current study aims to raise awareness about the role of ICT and 21st century skills in education and research. Research may help us to understand what works and why, as well as the importance of ICT and 21st century skills in present education scenario. Further study may be conducted to discover research difficulties, as well as viable answers and implementation methods to address those challenges for the benefit of the education sector, as well as the well-being of our educational system and society.

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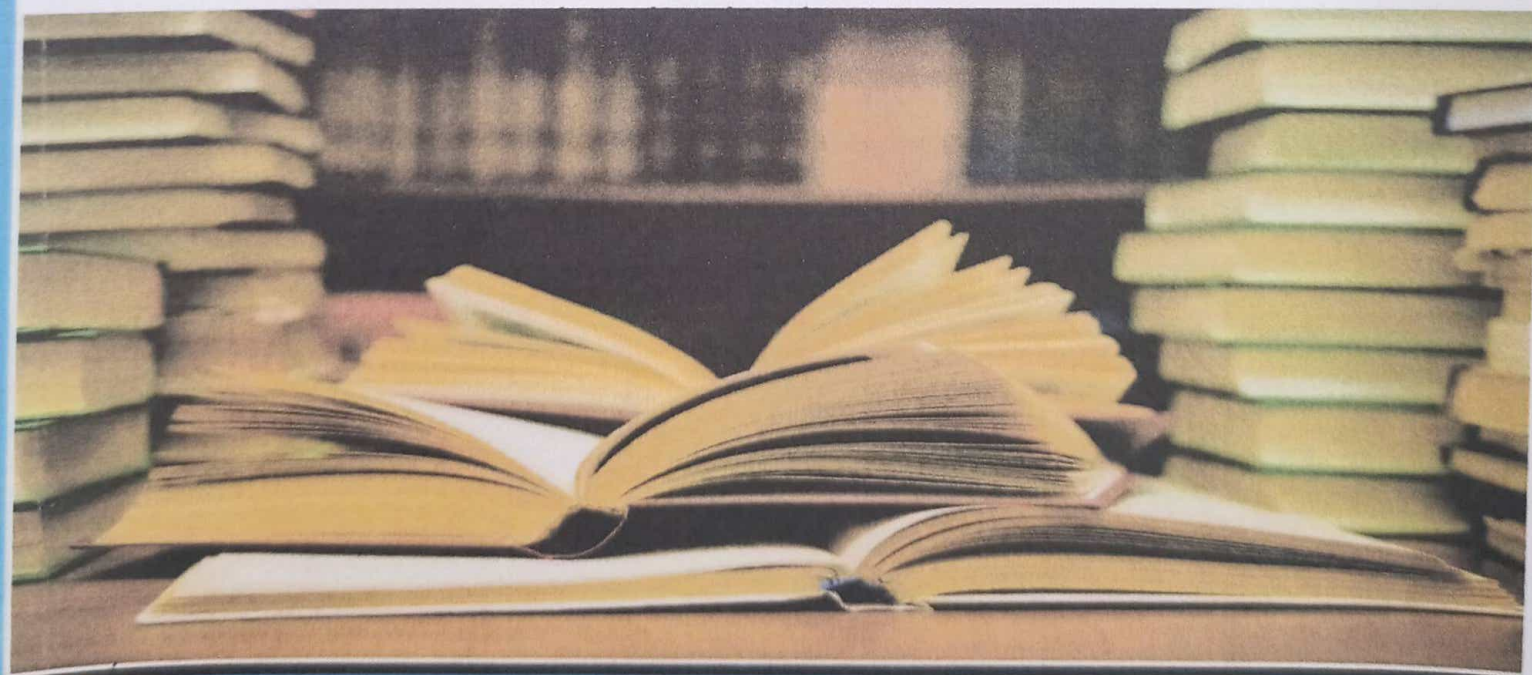
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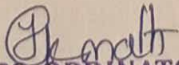
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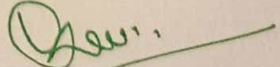
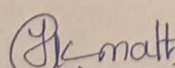
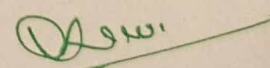

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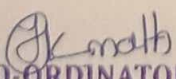
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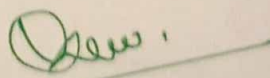
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A Monograph :
Impression of Physical Education Sport and Games
Apropos Education Consequence

By

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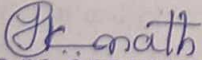
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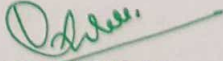
Abstract

The well-controlled longitudinal studies generally support cross-sectional research, suggesting that academic achievement is maintained or enhanced by increased physical education, physical activity. Sport when a substantial proportion of curricular time up to an extra hour per day is allocated to physical education, physical activity or sport, learning seems to proceed more rapidly per unit of classroom time. Perceptual skills, attention and concentration are all improved by about of physical activity. Positive relationship exists between physical activity and cognition. Prior exercise may be beneficial for cognitive function. There is a positive association between physical activity and several components of mental health, including self-esteem, emotive wellbeing, spirituality and future expectations. Physical activity has a positive impact on anxiety, depression, mood, and wellbeing. To impress on whole school attendance, physical education and school sport programmes should be innovative, engage in a planned and systematic way. Physical activity sport and Games have been shown to impress positively on the extent to which young people feel connected to their school; the aspirations of young people, the extent to which positive social behaviours exist within school and the development of leadership and citizenship skills.

Key Words

longitudinal, substantial proportion, Perceptual skills, Prior exercise, cognitive, emotive.


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Introduction

A person who regularly plays sports develops a healthy body, develops better body strength and better coordination. The physical benefits also include maintaining a healthy weight, preventing chronic diseases and learning the skills necessary to maintain a healthy lifestyle. As we all know the time allocated to physical education in the majority of western schools has declined over the last decade, with a consequent increase in time allocation for other academic subjects. Budget restraints and pressure to meet academic targets have caused schools to cut back on physical education, with the aim of improving academic performance. There was even a perception amongst key decision makers that time spent on non-academic pursuits might impact negatively on academic achievement. However, advocates of school-based physical activity have suggested that physical education, physical activity and sport may contribute to the enhancement of academic performance either directly or through the achievement of wider social outcomes which, in turn, may impact on academic achievement. One area of recent current interest has been whether or not participation in sport and other forms of physical activity can enhance cognitive function, including memory and concentration.

Sports and games make you more fit. They make your muscles stronger and keep the bones, heart, and lungs in good condition. When you play sports regularly, you use up the fatty molecules. It implies that you have less chance of blood clotting and heart attack. Studies have shown that exercise increases blood flow to the brain and helps the body build more connections between nerves, leading to increased concentration, enhanced memory, stimulated creativity, and better-developed problem solving skills. In short, playing sports helps your brain grow and makes it work better. Large, all-encompassing monographs examining this relationship between physical activities and learning behaviour have suggested that school children may indeed derive cognitive benefits from participation in physical activity including sport. Associated with these cognitive benefits it has been suggested that physical education, physical activity and sport may enhance classroom behaviour contributing to the enhanced academic achievement of pupils. Furthermore, it has been suggested that physical education, physical activity and sport have the potential to impact on school attendance, which in turn could impact on academic achievement. For example, there is a strong relationship between attendance and exam performance, even after prior attainment is taken into account and significant relationships have been identified between attendance and skill acquisition, knowledge and understanding, behaviour, personal development, relationships, parents' views on the school and also pupils' attitudes to school. Physical Education, Sports and Games promotes physical fitness, develops motor skills and the understanding of rules, concepts and strategies of playing games and sports. Students learn to either work as part of a team, or as individuals in a wide variety of competitive activities.

Finally it has been argued that the potential psychological and social benefits of physical education, physical activity and sport may indirectly enhance academic performance by enhancing mental health, improving feelings of connectedness with school and by enhancing positive social behaviours. The purpose of this monograph is to examine the impact of physical education and sport on academic achievement and on those wider social outcomes which might impact on academic achievement and other aspects of school performance. For young people sport forms a

major component of physical activity and therefore those studies which have examined physical activity in the broadest sense are included in the monograph.

Collision of Physical Education, Physical Activity, Sport and Games on Academic Achievements

This is a thorough review and highlights the strengths and limitations of the studies cited. One of the limitations of many of the studies is the failure to control substantial influencing variables such as socioeconomic status, which is the strongest predictor of academic achievement. It is thought that socioeconomic status is a leading influence of academic achievement due to the increasing opportunities and environments provided for learning with higher levels of socioeconomic status. However, one recent North American study on public school children has shown that the relationship between fitness and academic achievement remained significant after controlling for both socioeconomic status and race/ethnicity. Furthermore, as cited in the review the relationship between physical activity and academic achievement was still evident after parental education had been controlled.

Impression of Physical Education, Physical Activity Sport and Games on Cognitive Function

There is an extensive literature concerning the effect of single bouts of physical activity on cognitive function in young people and some studies examining the longitudinal (or chronic) impact of undertaking extra physical activity over or example a few months on cognitive function. It is important to include such information in this review as each physical education lesson or sport activity represents a bout of physical activity which might have an impression on learning on that day and indeed over a period of time. Cognitive function is often examined using computer tests and may include tests of memory, attention, perceptual skills and occasionally in longitudinal, studies IQ tests. Three meta-analyses statistical analysis of several earlier studies have previously been conducted on physical activity and its influence on cognitive processes in youth. Investigated the effect of long-term and acute exercise on cognition, resulting in an overall effect size of 0.25 when reviewing 134 studies in this case effect size refers to the impact of physical activity on cognition with 0.2, 0.5 and 0.8 respectively referring to low, medium and high impression on cognition. They concluded that physical activity has a small, positive effect on various aspects of cognition. However, the authors did notice that as the experiments became more tightly controlled, the effect sizes consequently decreased less of a positive effect.

Impression of Physical Education, Physical Activity, Sport and Games on Classroom Behaviours that may Impression on Academic Achievements

The Physical activity has a positive effect on classroom behaviour according to the data presented in extensive monograph on the selected topic. According to several authors, young people undertaking additional physical activity during the school day generally demonstrate increased brain function, improved self-esteem and better behaviour. Three longitudinal intervention studies from France, Australia and Canada on school children were consistent in showing that when the amount of time dedicated to physical activity was increased, the teachers reported better behaviour and higher motivation in pupils towards their academic work. However, the teacher assessments and behavioural opinions collected from such studies may partly reflect teacher attitudes towards the intervention. For example, in

the TroisRivieres study which increased time dedicated to physical education at the expense of academic instruction, 80% of the teaching staff was in favour of the activity programme, with the remainder holding a neutral point of view. Whilst teachers suggested that the activity programme substantially improved behaviour, objective class reports did not support the teacher suggestions.

The Impression of Physical Education, Physical Activity, Sport and Games on Psychological and Social Benefits which Impresses on Academic Achievements

Mental Health Which includes Self-Esteem and Confidence:-

The U.S. National Longitudinal Study of Adolescent Health reported a positive association between physical activity and several components of mental health, including self-esteem, emotive well-being, spirituality, and future expectations. Similarly it has been stated that the positive impression of physical activity on anxiety, depression, mood, and wellbeing are not disputed. Regular physical activity in adolescents is significantly related to a favourable self-image, in addition to physical and psychological well-being. A study on German adolescents observed lower anxiety and depression scores, as well as less social behavioural inhibition, than their less active peers. The significant relationship between physical activity and self-image also remains after controlling for socioeconomic status.

Some of the Modulation Findings are:-

There are 48% of head teachers reported that school attendance had improved, slightly or „markedly“ since their school had become involved in the SSP with most of the remainder reporting no change (45%). Case studies indicated the programme caused an increased motivation to attend school amongst pupils, giving them opportunities and events to look forward to through increasing Physical Education and sport/extracurricular activities. Attendance data in one school which increased curriculum Physical Education and sport increased from 89.9% in 2000/1 to 94.2% in 2005/6. In another case study school where a swimming pool was constructed 42% of children self-reported that they were more on time for school, while staff commented in a further case study example that the introduction of a morning activity programme had resulted in better punctuality and attendance from pupils. Head teachers and school staff felt that School Sport Partnership activities had enhanced motivation for school, particularly amongst target groups. 57% of head teachers reported that the School Sport Partnership programme had had a slight or substantial positive impact on attendance in their school. Overall increasing Physical Education and school sport appeared to be an effective strategy for improving attendance, especially where it was part of a wider package aimed at whole school change.

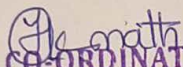
Conclusion

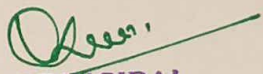
The impact whole school attendance, physical education and school sport programmes should be innovative, engage the whole school in daily or weekly activity programmes and, importantly, be fully integrated within a multi-dimensional school aim of improving attendance, increasing attainment, and changing attitudes to learning. Physical education, physical activity and sport have been shown to impact positively on the extent to which young people feel connected to their school; the aspirations of young people; the extent to

which positive social behaviours exist within school; and the development of leadership and citizenship skills. Participating in sports and games also make our Physical health fit. Our bones strong, increases our self-confidence, Communication skill, Body figure. Sports and Games are also helpful to take proper decisions in life and in harder situations, our life became more disciplined.

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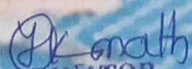
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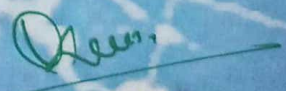
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Amusement, Athleticism and Calisthenics A Reverberations on Pedagogical Achievements

By

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ABSTRATE

Across and away from authentic and practical to a mechanistic perspective, physically active and aerobically fit children “one's ability to execute daily activities with optimal performance, endurance, and strength with the management of disease, fatigue, and stress and reduced sedentary behaviour.” consistently outperform their inactive and unfit peers academically on both a short- and a long-term basis. Time spent engaged in physical activity is related not only to a healthier body but also to enriched cognitive development and lifelong brain health. Collectively, the findings across the body of literature in this area suggest that increases in aerobic fitness, derived from physical activity, are related to improvements in the integrity of brain structure and function that underlie academic performance. The strongest relationships have been found between aerobic fitness and performance in mathematics, reading, and English. For children in a school setting, regular participation in physical activity is particularly beneficial with respect to tasks that require working memory and problem solving. These findings are corroborated by the results of both authentic correlational studies and experimental randomized controlled trials. Overall, the benefits of additional time dedicated to physical education and other physical activity opportunities before, during, and after school outweigh the benefits of exclusive utilization of school time for academic learning, as physical activity opportunities offered across the curriculum do not inhibit academic performance.

Both habitual and single bouts of physical activity contribute to enhanced academic performance. Findings indicate a robust relationship of acute exercise to increased attention, with evidence emerging for a relationship between participation in physical activity and disciplinary behaviours, ~~time on task~~, and academic performance. Specifically, higher-fit children allocate greater resources to ~~time on task~~ and demonstrate less reliance on environmental cues or teacher prompting.

Key Words

Authentic, mechanistic, cognitive, randomized, habitual, robust, allocate, environmental cues

INTRODUCTION

Although academic performance stems from a complex interaction between intellect and contextual variables, health is a vital moderating factor in a child's ability to learn. The idea that healthy children learn better is empirically supported and well accepted and multiple studies have confirmed that health benefits are associated with physical activity, including cardiovascular and muscular fitness, bone health, psychosocial outcomes, and cognitive and brain health. Amusement means damian heard the amusement in his voice, my favourite amusement is sailing, at the amusement in his voice, she flushed, a flicker of amusement crossed her face. Amusement twinkled in his eyes and played with the corners of his mouth. The relationship of physical activity and physical fitness to cognitive and brain health and to academic performance.

The exercises can function as physique builders or serve as warm-ups for more-strenuous sports or exertions. Given that the brain is responsible for both mental processes and physical actions of the human body, brain health is important across the life span. In adults, brain health, representing absence of disease and optimal structure and function, is measured in terms of quality of life and effective functioning in activities of daily living. In children, brain health can be measured in terms of successful development of attention, on-task behavior, memory, and academic performance in an educational setting. This chapter reviews the findings of recent research regarding the contribution of engagement in physical activity and the attainment of a health-enhancing level of physical fitness to cognitive and brain health in children. Correlational research examining the relationship among academic performance, physical fitness, and physical activity also is described. Because research in older adults has served as a model for understanding the effects of physical activity and fitness on the developing brain during childhood, the adult research is briefly discussed. The short- and long-term cognitive benefits of both a single session of and regular participation in physical activity are summarized.

“Athleticism is the ability to repeatedly perform a range of movements with precision and confidence in a variety of environments, which require competent levels of motor skills, strength, power, speed, agility, balance, coordination, and endurance.” Calisthenics, free body exercises performed with varying degrees of intensity and rhythm, which may or may not be done with light handheld apparatuses such as rings and wands. The exercises employ such motions as bending, stretching, twisting, swinging, kicking, and jumping, as well as such specialized movements as push-ups, sit-ups, and chin-ups. Calisthenics promote strength, endurance, flexibility, and coordination and augment the body's general well-being by placing controllable, regular demands upon the cardiovascular system.

Reverberations are the continuous multiple reflections of sound in a big enclosed space is reverberation. It can be reduced by covering walls and ceiling of enclosed space with the help of sound absorbing materials such as loose woollens, fibre boards. Before outlining the health benefits of physical activity and fitness, it is important to note that many factors influence academic performance. Among these are socioeconomic status, parental involvement, and a host of other demographic factors. A valuable predictor of student academic performance is a parent having clear expectations for the child's academic success. Attendance is another factor confirmed as having a significant impact on academic performance. Because children must be present to learn the desired content, attendance should be measured in considering factors related to academic performance.

Cardiovascular Fitness and Physical Activity Its Relation to Academic Achievements

Authorised academic achievement testing has had the unintended consequence of reducing opportunities for children to be physically active during the school day and beyond. In addition to a general shifting of time in school away from physical education to allow for more time on academic subjects, some children are withheld from physical education classes or recess to participate in remedial or enriched learning experiences designed to increase academic performance. Yet little evidence supports the notion that more time allocated to subject matter will translate into better test scores. Indeed, 11 of 14 correlational studies of physical activity during the school day demonstrate a positive relationship to academic performance. Overall, a rapidly growing body of work suggests that time spent engaged in physical activity is related not only to a healthier body but also to a healthier mind.

Children respond faster and with greater accuracy to a variety of cognitive tasks after participating in a session of physical activity. A single bout of moderate-intensity physical activity has been found to increase neural and behavioural concomitants associated with the allocation of attention to a specific cognitive task. And when children who participated in 30 minutes of aerobic physical activity were compared with children who watched television for the same amount of time, the former children cognitively outperformed the latter. Visual task switching data among 69 overweight and inactive children did not show differences between cognitive performance after treadmill walking and sitting.

When physical activity is used as a break from academic learning time, post engagement effects include better attention, increased on-task behaviours, and improved academic performance. Comparisons between 1st-grade students housed in a classroom with stand-sit desks where the child could stand at his/her discretion and in classrooms containing traditional furniture showed that the former children were highly likely to stand, thus expending significantly more energy than those who were seated. More important, teachers can offer physical activity breaks as part of a supplemental curriculum or simply as a way to reset student attention during a lesson and when provided with minimal training can efficaciously produce vigorous or moderate energy expenditure in students. Further, after-school physical activity programs have demonstrated the ability to improve cardiovascular endurance, and this increase in aerobic fitness has been shown to mediate improvements in academic performance, as well as the allocation of neural resources underlying performance on a working memory task

Physical Fitness as a Learning Outcome of Physical Education and Its Relation to Academic Performance

Achieving and maintaining a healthy level of aerobic fitness, as defined using criterion-referenced standards from the National Health and Nutrition Examination Survey, is a desired learning outcome of physical education programming. Regular participation in physical activity also is a national learning standard for physical education, a standard intended to facilitate the establishment of habitual and meaningful engagement in physical activity. Yet although physical fitness and participation in physical activity are established as learning outcomes in all 50 states, there is little evidence to suggest that children actually achieve and maintain these standards.

State wide and national datasets containing data on youth physical fitness and academic performance have increased access to student-level data on this subject. Early research in South Australia focused on quantifying the benefits of physical activity and physical education during the school day; the benefits noted included increased physical fitness, decreased body fat, and reduced risk for cardiovascular disease. Even today, Dwyer and colleagues are among the few scholars who regularly include in their research measures of physical activity intensity in the school environment, which is believed to be a key reason why they are able to report differentiated effects of different intensities. A longitudinal study tracked how the academic performance of children from grades 1 through 6 was related to student health,

motor skills, and time spent in physical education. The researchers concluded that additional time dedicated to physical education did not inhibit academic performance.

Moreover, the findings may support a dose-response association, suggesting that the more components of physical fitness e.g., cardiovascular endurance, strength, muscle endurance, considered acceptable for the specific age and gender that are present, the greater the likelihood of successful academic performance. From a public health and policy standpoint, the conclusions these findings support are limited by few causal inferences, a lack of data confirmation, and inadequate reliability because the data were often collected by non-researchers or through self-report methods. It may also be noted that this research includes no known longitudinal studies and few randomized controlled trials.

Physical Activity, Physical Education and Academic Achievements

Constricted with the correlational data presented above for physical fitness, more information is needed on the direct effects of participation in physical activity programming and physical education classes on academic performance.

In a recent research it was found that a positive relationship between physical activity and cognition in school-age youth (aged 4-18) suggesting that physical activity, as well as physical fitness, may be related to cognitive outcomes during development. Participation in physical activity was related to cognitive performance in eight measurement categories, perceptual skills, IQ, achievement, verbal tests, mathematics tests, memory, developmental level/academic readiness, and other, with results indicating a beneficial relationship of physical activity to all cognitive outcomes except memory. Since that meta-analysis, however, several papers have reported robust relationships between aerobic fitness and different aspects of memory in children. Regardless, the comprehensive review of Sibley was important because it helped bring attention to an emerging literature suggesting that physical activity may benefit cognitive development even as it also demonstrated the need for further study to better understand the multifaceted relationship between physical activity and cognitive and brain health. The regular engagement in physical activity achieved during physical education programming can also be related to academic performance, especially when the class is taught by a physical education teacher. The Sports, Play, and Active Recreation for Kids study examined the effects of a 2 years health related physical education program on academic performance in children.

Affair of Honour of Physical Activity

Wonder formal physical education, evidence suggests that multi-component approaches are a viable means of providing physical activity opportunities for children across the school curriculum. Although health-related fitness lessons taught by certified physical education teachers result in greater student fitness gains relative to such lessons taught by other teachers non-physical education teachers are capable of providing opportunities to be physically active within the classroom. Single sessions or bouts of physical activity have independent merit, offering immediate benefits that can enhance the learning experience. Studies have found that single bouts of physical activity result in improved attention, better working memory, and increased academic learning time and reduced off-task behaviours. Yet single bouts of physical activity have differential effects, as very vigorous exercise has been associated with cognitive fatigue and even cognitive decline in adults.

Development of Brain, Physical Activity and Health

The investigation of brain health has grown beyond simply measuring behavioural outcomes such as task performance and reaction time e.g., cognitive processing speed. Much new technology has emerged that has allowed scientists to understand the impact of lifestyle factors on the brain from the body

systems level down to the molecular level. A greater understanding of the cognitive components that sub serve academic performance and may be amenable to intervention has thereby been gained.

Youngsters Development, Brain Structure and its Function

Unquestionable aspects of development have been linked with experience, indicating an intricate interplay between genetic programming and environmental influences. Gray matter and the organization of synaptic connections in particular, appears to be at least partially dependent on experience with the brain exhibiting a remarkable ability to reorganize itself in response to input from sensory systems, other cortical systems, or insult. During typical development, experience shapes the pruning process through the strengthening of neural networks that support relevant thoughts and actions and the elimination of unnecessary or redundant connections. Accordingly, the brain responds to experience in an adaptive or "plastic" manner, resulting in the efficient and effective adoption of thoughts, skills, and actions relevant to one's interactions within one's environmental surroundings. Examples of neural plasticity in response to unique environmental interaction have been demonstrated in human neuroimaging studies of participation in music, thus supporting the educational practice of providing music education and opportunities for physical activity to children.

Consequence of Regular Engagement in Physical Activity and Physical Fitness on Brain Structure

Recent advances in neuroimaging techniques have rapidly advanced understanding of the role physical activity and aerobic fitness may have in brain structure. In children a growing body of correlational research suggests differential brain structure related to aerobic fitness. Some of the Research showed a relationship among aerobic fitness, brain volume, and aspects of cognition and memory. Specifically 9- to 10-year-old preadolescent children to lower- and higher-fitness groups as a function of their scores on a maximal oxygen uptake VO₂max test, which is considered the gold-standard measure of aerobic fitness. They observed larger bilateral hippocampal volume in higher-fit children using MRI, as well as better performance on a task of relational memory. It is important to note that relational memory has been shown to be mediated by the hippocampus. Further, no differences emerged for a task condition requiring item memory, which is supported by structures outside the hippocampus, suggesting selectivity among the aspects of memory that benefit from higher amounts of fitness. Lastly, hippocampal volume was positively related to performance on the relational memory task but not the item memory task, and bilateral hippocampal volume was observed to mediate the relationship between fitness and relational memory. Such findings are consistent with behavioural measures of relational memory in children and neuroimaging findings in older adults and support the robust nonhuman animal literature demonstrating the effects of exercise on cell proliferation and survival in the hippocampus.

Paper Limitations

In sprit of the promising findings described in this chapter, it should be noted that the study of the relationship of childhood physical activity, aerobic fitness, and adiposity to cognitive and brain health and academic performance is in its early stages. Accordingly, most studies have used designs that afford correlation rather than causation. To date, in fact, only two randomized controlled trials on this relationship have been published. However, several others are currently on going, and it was necessary to provide evidence through correlational studies before investing the effort, time, and funding required for more demanding causal studies. Given that the evidence base in this area has grown exponentially in the past 10 years through correlational studies and that causal evidence has accumulated through adult and nonhuman animal studies, the next step will be to increase the amount of causal evidence available on school-age children.

Conclusion

Physical Education sports and games activities are very essential in one's life to excel in academics and day to day activities. Ultimately although a number of studies have described the relationship of physical activity, fitness, and adiposity to standardized measures of academic achievements, few attempts have been made to observe the relationship within the context of the educational environment. Standardized tests, although necessary to gauge knowledge, may not be the most sensitive measures for the process of learning. Future research will need to do a better job of translating promising laboratory findings to the real world to determine the value of this relationship in ecologically valid settings. Participating in sports and games also make our Physical health fit. Our bones also get strong by playing sports and games. Playing sports and games increases our self - confidence, communication skill, body figure. Sports are also helpful to take proper decisions in life and in harder situations, our life became more disciplined.

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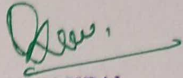
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