CHAPTER 3

REVIEW OF RELATED LITERATURE

3.1 LITERATURE ON READING SKILL
3.2 LITERATURE ON MENTAL MODELS
3.3 LITERATURE ON MULTIPLE STRATEGY INSTRUCTION
INTRODUCTION

The review of related literature plays a significant role in any piece of research work. Mouly (1964) in his work ‘The Science of Educational Research’, mentions the study of related literature as a crucial step which invariably minimizes the risk of dead ends, rejected topics, watershed efforts and trial and error activities engaged in by previous investigators. Related literature has a vital role in planning and preparing the research materials. Best and Kahn (2003) remarked: “A brief summary of previous research and the writings of recognized experts provide evidence that the researcher is familiar with what is already known and what is still unknown and untested”.

Only the knowledge of the past will help us to equip for the present. In that sense review of related literature is essential and it plays a significant role in research work. Research always takes the advantages of the knowledge which has accumulated in the past as a result of human endeavor. For any worthwhile research, the research worker needs an adequate familiarity with literature available in that field of study. According to Best and Kahn (2003), “practically all human knowledge can be found in books and libraries unlike other animals that must start anew with each generation; man builds upon the accumulated and recorded knowledge of the past”.

Koul (1997) identified the following purposes of the review of related literature. The review of related literature enables the researcher

1. to define the limits of the field;
2. to delimit and define his problem;
3. to being up-to-date his knowledge in the area of his work;
4. to avoid unfruitful and useless problem areas;
5. to avoid unintentional duplication of well established findings;
6. to make an understanding of the research methodology;
7. to know about the tools and instruments for the study; and
8. to know about the recommendations of previous researchers listed in their studies for further research.

Review of related literature, allows the researcher to be acquainted with current knowledge in the field or area in which the research is going to be conducted. Review of literature avoids duplication of work that has already been done and it helps the investigator to go deep into the problem at hand and to study the different sides of the problem.

Since the present study is aimed to enhance Reading Competency in English at Upper Primary School Level, literature related to Reading Skill, Mental Models as well as Multiple Strategy Instruction were reviewed from the Encyclopedia of Education, Educational Surveys, Journals of Education, Educational Year Books, Dissertations and Research Abstracts. The literature reviewed are organized and presented under the following sections.

3.1 Literature on Reading Skill
3.2 Literature on Mental Models
3.3 Literature on Multiple Strategy Instruction

The details of the literature reviewed follow.

3.1 LITERATURE ON READING SKILL
Deacon et al. (2014) examined the role of a hypothesized factor in reading comprehension: morphological awareness, or the awareness of and ability to manipulate the smallest meaningful units or morphemes. In this longitudinal study, they measured English-speaking children’s morphological awareness, word reading skills, and reading comprehension at Grades 3 and 4, in addition to their phonological awareness, vocabulary, and nonverbal ability as control measures. Path analyses revealed that word reading skills partially mediated the relationship between morphological awareness and reading
comprehension at each grade. Further, children’s early morphological awareness partially explained children’s gains in reading comprehension, and their early reading comprehension partially explained their gains in morphological awareness. These findings support the predictions of recent models of reading comprehension: that morphological awareness impacts reading comprehension both indirectly through word reading skills and directly through the language system and that morphological awareness underpins the development of reading comprehension.

**Kjeldsen et al. (2014)** studied the effects of a kindergarten training program in phonological awareness with 209 Swedish-speaking children were followed up until the end of Grade 9. Initial levels of letter knowledge and phonological awareness were positively associated with the level of decoding skill in Grade 3 but not with its growth afterward. The intervention group performed significantly better in decoding in Grade 3, and the difference was maintained until Grade 6. The trained children also scored higher in Grade 9 reading comprehension. Although the results give empirical support for a connection between early phonological awareness training, later word decoding development, and still later reading comprehension.

**Rakhlin et al. (2014)** studied the relationship between rapid serial naming (RSN) and orthographic processing in Russian, an asymmetrically transparent orthography. Ninety-six students completed tests of word and pseudo word reading fluency, spelling, orthographic choice, phonological choice, phoneme awareness (PA), and RSN. PA was a better predictor of orthographic skills and pseudo word reading accuracy than RSN, which accounted for more variance in word and pseudo word reading fluency. Controlling for pseudo word reading fluency washed out RSN’s contribution to word reading fluency. These results extend previous findings questioning the role of RSN as an index of orthographic
processing skills and support the idea that RSN taps into automaticity/efficiency of processing print-sound mappings.

Ashby et al. (2013) examined that although phonemic awareness is a known predictor of early decoding and word recognition, less is known about relationships between phonemic awareness and text reading fluency. This longitudinal study is the first to investigate this relationship by measuring eye movements during picture matching tasks and during silent sentence reading. Time spent looking at the correct target during phonemic awareness and receptive spelling tasks gauged the efficiency of phonological and orthographic processes. Children's eye movements during sentence reading provided a direct measure of silent reading fluency for comprehended text. Results indicate that children who processed the phonemic awareness targets more slowly in Grade 2 tended to be slower readers in Grade 3. Processing difficulty during a receptive spelling task was related to reading fluency within Grade 2. Findings suggest that inefficient phonemic processing contributes to poor silent reading fluency after second grade.

Burgoyne et al. (2013) identified that children learning English as an additional language (EAL) often experience difficulties with reading comprehension relative to their monolingual peers. While low levels of vocabulary appear to be one factor underlying these difficulties, other factors such as a relative lack of appropriate background knowledge may also contribute. Sixteen children learning EAL and 16 of their monolingual peers, matched for word reading accuracy, were assessed using a standard measure of reading comprehension and an experimental measure of reading comprehension for which relevant background knowledge was taught before assessing understanding. Tests of receptive and expressive vocabulary were also completed. Results confirmed lower levels of reading comprehension for children learning EAL for both standard and
"background" controlled measures. Analysis of comprehension by question type on the experimental measure showed that while both groups made use of taught knowledge to answer inferential questions, children learning EAL had specific difficulties with both literal questions and questions requiring the interpretation of a simile. It is suggested that relevant background information should be used to facilitate children's text comprehension. Furthermore, several factors, especially vocabulary differences, but also text search strategies, context use and comprehension monitoring skills, may contribute to the comprehension difficulties experienced by children learning EAL.

**Devonshire et al. (2013)** developed a novel intervention to teach reading and spelling literacy to 5 to 7 year-old students using explicit instruction of morphology, etymology, phonology, and form rules. They examined the effects of the intervention compared to a phonics-based condition using a cross-over design with a baseline measure. One hundred and twenty children attending an English state funded primary school were randomly allocated either to a traditional phonics condition followed by the novel intervention, or to the novel intervention followed by the phonics condition. The novel intervention significantly improved the literacy skills of the children including both word reading and spelling compared with the phonics condition. They conclude that early teaching of English literacy should include instruction in morphology, etymology and rules about form in addition to traditional phonics. They suggest that the results of the study could inform future policy on the teaching of English literacy skills.

**Gustafson et al. (2013)** studied decoding and comprehension's contribution to reading ability both in children with reading difficulties and in children with typical reading ability. Decoding and comprehension was further divided into sub-components, and the contribution from non-verbal ability and general processing speed was also studied. The results
demonstrated that decoding made the largest contribution to reading ability for children with reading difficulties, while language comprehension contributed the most for children with typical reading ability. The contribution of non-verbal ability was not significant, and general processing speed only made a significant contribution to decoding for typical children. The two factors in the Simple View of Reading, decoding and comprehension, together explained less of the variance in reading ability for children with reading difficulties than for children with typical reading ability.

**Hunley et al. (2013)** investigated the relationship between oral reading fluency and performance on a statewide reading achievement test for middle grades students. Participants in this study were 75 seventh grade students. One month before the students were administered the state test, each student read three probes from their current basal reader to determine an oral reading fluency rate. The Ohio Grade 7 Reading Test scores were correlated with oral reading fluency rates to determine the extent of the relationship between the results. Results support the use of oral reading fluency assessment as a valid tool for identifying students at risk of not passing the statewide reading achievement test.

**MacDonald et al. (2013)** used multiple regression to determine the predictive value of Kindergarten phonemic awareness, rapid serial naming, letter knowledge, and cognitive ability for predicting first-grade word reading and fluency. Participants were 131 first-grade students from a mid-Atlantic school system. A combination of predictor variables was found to be more effective than single measures in predicting later word reading and reading fluency, with cognitive ability, phonemic awareness, and letter knowledge contributing significantly to the prediction of skill. The results underscore the need to use a multivariate battery, rather than any single
measure, along with consideration of intelligence, to identify children for early intervention.

**Melekoglu and Wilkerson (2013)** examined the lack of reading motivation impedes upper elementary and secondary school students' willingness to improve critical reading skills and strategies to be successful in school. Struggling readers often show a negative attitude towards reading tasks and manifest low motivation to read. Although the importance of motivation is clear, there is limited research on reading motivation of struggling adolescents with disabilities. This study examined whether reading motivation of struggling readers with and without disabilities significantly changed after an eighteen week period of reading instruction in two elementary schools and one high school in a Midwest state of the United States of America (USA). Findings yielded significant improvement in motivation for adolescents without disabilities while motivation scores declined for students with disabilities. An overview of students' answers to survey questions is provided and some evidence-based methods that teachers can utilize to improve reading motivation of upper elementary and high school students are summarized.

**Memis and Bozkurt (2013)** investigated the relationship between metacognitive awareness, reading motivations, reading levels and reading comprehension success of fifth grade students using comparative relative scan model. There were 577 students. In the result of the research, in which data were collected with four scales, it was concluded that reading comprehension level of independent level readers was high and anxiety level decreases reading comprehension. There was not a differentiation in distribution according to sex and independent readers had the highest reading comprehension scores in both sexes. There is a moderately significant relation between reading comprehension and metacognitive reading comprehension, internal-external motivation and reading level.
Metacognitive reading comprehension expresses 33% of total variance including internal-external motivation and reading level variables. According to standardized regression co-efficient, predictor variables on reading comprehension are reading level, metacognitive reading comprehension, external motivation and internal motivation respectively in significance order.

Yamashita (2013) viewed that despite the growing number of studies highlighting the complex process of acquiring second language (L2) word recognition skills, comparatively little research has examined the relationship between word recognition and passage-level reading ability in L2 learners; further, the existing results are inconclusive. This study aims to help fill the gap. Three word recognition subcomponents - decoding, sight word reading, and lexical meaning access - and general English language ability were examined in terms of their contributions to predicting the reading comprehension and reading rate of Japanese university students learning English. Multiple regression analyses revealed that, in addition to the contribution made by English language ability, lexical meaning access was a significant predictor of both reading comprehension and reading rate, and decoding was a predictor of reading rate only. These results not only supported some previous findings but also added new insight into the influence of efficiency of lexical meaning access to reading comprehension.

Abbott et al. (2012) examined 920 second and 974 third graders. Results found a significant relationship between error rate, oral reading fluency, and reading comprehension performance, and grade-specific guidelines for appropriate error rate levels. Low reading fluency and high error rates predicted the level of passage comprehension performance. For both second and third grade students, fall assessment error rate predicted
comprehension performance. The acceptable third grade error rate cut point was 14%.

**Fisher et al. (2012)** studied the middle grades with varying amounts of background knowledge. Teachers must assess student background knowledge for gaps or misconceptions and then provide instruction to build on that base. This article discusses effective strategies for assessing and developing students' background knowledge so they can become independent learners who make personal connections to their learning. Strategies include assessing students' reading abilities, providing direct experiences with content, and building vocabulary.

**Jeon (2012)** investigated the role of oral reading fluency in second language reading. Two hundred and fifty-five high school students in South Korea were assessed on three oral reading fluency (ORF) variables and six other reading predictors. The relationship between ORF and other reading predictors was examined through an exploratory factor analysis (EFA). Next, the contribution of ORF to silent reading comprehension was investigated through multiple regression analyses (MRA) with ORF variables as predictors of reading comprehension. EFA identified two factors (fluency and comprehension) and showed that passage reading fluency cross loaded with both factors. MRA results indicated that the three ORF variables collectively explained 21.2% of variance in silent reading comprehension. Oral passage reading fluency alone explained 20.9% of variance in silent reading comprehension. After controlling for pseudo word reading and word reading fluency, oral passage reading fluency still accounted for an additional 12.4% of the remaining reading variance.

**Jiang et al. (2012)** examined the relationship among word reading efficiency, text reading fluency, and reading comprehension for adult English as a Foreign Language (EFL). Data from 185 adult Chinese EFL
learners preparing to take the Test of English as a Foreign Language (TOEFL) were analyzed in this study. The participants completed a computer-based test battery of word reading efficiency and text reading fluency in addition to TOEFL iBT (Internet-Based Test) reading comprehension. The findings showed a stronger relationship between text oral reading fluency and reading comprehension than between word reading efficiency and reading comprehension. The authors recommended that attention be paid to text oral reading fluency in adult EFL reading research and instruction.

Jones (2012) presented the theoretical frameworks of genre theory, reading strategies and situated learning are used to show the complexity of the reading task for pupils in the English medium upper primary school in Singapore. An analysis of text genres from school textbooks of English, Maths and Science at primary three, shows how reading appropriately in the different disciplines requires the application of specific reading strategies, knowledge and attitudes. Content and process frameworks for teaching reading strategies are considered in the light of the analysis. The article concludes that recontextualising reading in this way involves rethinking the teaching of reading in the English medium primary school which requires teachers to increase our knowledge of discipline specific texts through text analysis and to deepen our knowledge of children's reading by talking to them about it.

Knell and Chi (2012) examined the roles of motivation, attitudes towards learning English, willingness to communicate, perceived competence, language anxiety, and parental support among upper primary immersion and non immersion students. Results indicate that immersion students used in this study had significantly higher levels of willingness to communicate and perceived competence and exhibited less language anxiety than their non immersion peers. In addition, willingness to communicate and
perceived competence were the strongest predictors of English reading and oral proficiency for the combined sample.

**Miller (2012)** described numerous research studies prove that wide reading improves children's comprehension, background knowledge, vocabulary, fluency, and writing. The author, a sixth-grade language arts teacher, describes the classroom conditions and instructional practices that encourage wide reading and increase her students' reading motivation such as choice in reading material, dedicating time for reading, and promoting children's literature.

**Mullock (2012)** described that the acquisition of spelling skills in English presents, for a substantial number of children, a significant challenge. Spelling skills do not automatically transfer from reading skills, and while many teachers are aware of the need to develop a separate word study program to assist with spelling development, time and confidence factors often result in their turning to commercial spelling programs for assistance. But to what extent do such programs reflect what contemporary research tells us about how spelling skills are acquired? The current study uses criteria developed from Cramer and Cipielewski (1995) to analyse 9 Australian commercial spelling programs designed for use in primary Years 4 to 6. The study found that although the majority of the programs contained treatment of basic morphological aspects of spelling, only 2 of the programs presented material designed to develop understanding of the more complex sound-symbol relationships of the English spelling system. Treatment of more complex morphemic principles was weak in almost all programs, and there was only limited coverage of compound words, homonyms, contractions, and words that are easily confused.

**Price et al. (2012)** reported on a method of assessing silent reading using underlining, an approach that solves many problems other silent reading
Review of Related Literature

fluency assessment measures face. This method computationally monitors readers’ silent reading fluency by the speed they underline words in a text. Traditional silent reading fluency measures were compared with the new underlining methodology. Fourth and sixth grade students completed silent reading fluency measures i.e., moving windows, underlining, and paper-and-pencil reading tasks, along with measures of their oral reading fluency, reading comprehension, and vocabulary knowledge. Strong alternate-form reliability coefficients were found for underlining, which significantly correlated with other measures of silent reading fluency and reading comprehension. Underlining methodology also correlated with common language factors, such as word length and word frequency. Together, these results provide support for the psychometric properties of underlining and suggest that it is a promising alternative method of assessing silent reading fluency.

Quirk and Beem (2012) examined the relations between reading fluency and comprehension among elementary school students (N = 171) in Grades 2, 3, and 5, all of whom were designated as English language learners (ELL) at some point in their educational careers. Although the overall relation between reading fluency and comprehension (r = 0.56) was consistent with previous research using non-ELL student samples, results also revealed a substantial number of students (55.5%) who exhibited a significant gap (SD, 0.67) between their scores on reading fluency and comprehension assessments. In addition, the prevalence of students with fluency/comprehension gaps varied significantly across grade and English language proficiency levels. The results suggested that, although reading fluency and comprehension are significantly related for ELL students, practitioners should be cautious when making identification and instructional decisions for ELL students based solely on oral reading fluency data.
Rasinski (2012) explored problems that have surfaced in the teaching of reading fluency and how teachers and reading coaches can resolve those problems. Specific issues addressed include reading fluency being defined as reading fast and instruction that is focused on having students read fast, reading fluency viewed as solely and oral reading activity, reading fluency seen as an issue only for the primary grades, and reading fluency instruction viewed as a distinct form of reading instruction not integral to authentic reading that focuses on meaning. The author makes the case for an authentic, meaning-based, and comprehensive approach to fluency instruction that is integral part of the core reading program.

Salvador et al. (2012) examined relationships between second grade oral reading fluency scores and third grade end-of-grade reading achievement scores for students (N = 9562) in a large school district in the United States. Stakeholder interviews were also conducted. In our model, oral reading fluency and reading comprehension scores were moderately correlated; oral reading fluency was the strongest predictor of subsequent achievement, followed by ethnicity; growth on oral reading fluency was not strongly associated with end-of-grade performance; and greater than 90% of students classified as "at risk" on benchmark assessments performed poorly on third grade assessments. Stakeholders believed that oral reading fluency testing was not necessary above selected levels of proficiency. We discuss implications of our findings for future research and practice.

Keung (2011) investigated transfer of reading-related cognitive skills between learning to read Chinese (L1) and English (L2) among Chinese children in Hong Kong. Fifty-three Grade 2 students were tested on word reading, phonological, orthographic and rapid naming skills in Chinese (L1) and English (L2). The major findings were: (a) significant correlations between Chinese and English measures in phonological awareness and
rapid naming, but not in orthographic skills; (b) significant unique contribution of Chinese and English rapid naming skills and English rhyme awareness for predicting Chinese word reading after controlling for all the Chinese and English cognitive measures; (c) significant unique contribution of English phonological skills and Chinese orthographic skills (a negative one) for predicting English word reading after controlling for all the English and Chinese cognitive measures; and (d) significant unique contribution of Chinese rhyme awareness for predicting English phonemic awareness. These findings provide initial evidence that developing reading-related cognitive skills in English may have facilitative effects on Chinese word reading development. They also suggest that Chinese orthographic skills or tactics may not be helpful for learning to read English words among ESL learners; and that Chinese rhyme awareness facilitates the development of English phonemic awareness which is an essential skill predicting ESL learning.

Kim et al. (2011) examined oral and silent reading fluency and their relations with reading comprehension. In a series of structural equation models with latent variables using data from 316 first-grade students, (a) silent and oral reading fluency were found to be related yet distinct forms of reading fluency, (b) silent reading fluency predicted reading comprehension better for skilled readers than for average readers, (c) list reading fluency predicted reading comprehension better for average readers than for skilled readers, and (d) listening comprehension predicted reading comprehension better for skilled readers than for average readers.

McNeil (2011) depicted that a number of studies have investigated the influence of background knowledge and reading comprehension strategies on comprehension, no L2 research exists examining and comparing the unique contributions of these two variables examined together. Therefore, the purpose of this exploratory study was to investigate the combined and
individual contributions of background knowledge and reading comprehension strategies to reading comprehension. Data collected from 20 university-level English language learners were analyzed using regression analyses. The results indicated that background knowledge and reading comprehension strategies, operationalized as self-questioning, combined to account for a significant portion of variance in reading comprehension scores, with self-questioning being a stronger predictor of reading comprehension than background knowledge.

Mohamed et al. (2011) conducted a cross-sectional study; which investigated the development of fluent reading and spelling in the first 3 years of learning Arabic. The goals of the study were to: (1) validate suitable measures for fluent reading and spelling in the first 3 years of learning Arabic; (2) trace the developmental course of the relationship between fluent reading and spelling in the first 3 years of learning Arabic; and (3) evaluate potential gender differences in literacy skills and intelligence in the setting. The performance of 111 native Arabic students of the first three grades was assessed for one-minute reading, spelling and Raven's Coloured Progressive Matrices (CPM). Results showed significant developments in all measures across age. Reading fluency correlated highly with spelling measures. Boys performed better than girls as indicated by each of the measures used. Further analyses of first grade data indicate a potential role for the interaction of reading, gender, and CPM on the spelling scores.

Rennie (2011) investigated a professional development initiative in Australia to address a decline in reading comprehension scores in the middle and upper years of Primary school. It described the professional learning journey of a middle primary teacher and his literacy coach over a period of 12 months as they worked to improve the teacher's knowledge and skills to explicitly teach reading comprehension. A series of classroom
observations and interviews at the beginning, middle and end of the school year were analysed for the kinds of reading skills taught and the nature of the instruction. The data suggest that there were significant changes in the teacher's pedagogical repertoires and practices and an observed improvement in the student's understandings of different comprehension knowledge, skills and strategies.

Netten et al. (2010) attempted to construct a multi-factor model predicting the development of reading literacy in the upper grades of primary school in the Netherlands for subgroups of 729 first language (L1) learners and 93 second language (L2) learners. Following a longitudinal design, it was explored to what extent the variation in reading literacy development in L1 and L2 from grade 4 to grade 6 can be explained from children's word decoding, language, mathematics and nonverbal reasoning skills, reading motivation and self confidence as well as their home reading resources. The results showed that L1 and L2 learners differed in reading literacy skills, language, mathematics, and reasoning skills. Structural equation modelling showed that the reading literacy development in both L1 and L2 learners could be explained from decoding, language, mathematics and reasoning skills, as well as their motivation and self-confidence. A striking difference was the fact that home reading resources had an impact on reading literacy in L1 learners but not in L2 learners.

Rader (2010) found out that the seemingly simple task associated with formal reading instruction may be problematic for many students with speech and language delays who often enter school with meager literacy experiences (B. K. Gunn, D. C. Simmons, & E. J. Kame'enui, 1999). However, the challenges that students face may be reduced when reading instruction includes opportunities for students to turn inward and reflect on ways that they use their language to read and write. The ability to reflect inward and use language to visualize words was thought to be a powerful
tool for this population. The author developed a 2-year pilot program to determine whether a set of 9 key questions would help this population of students to increase the visualization and retell skills necessary for effective reading comprehension.

**Spear-Swerling et al. (2010)** examined sixth-graders' reading comprehension and component reading abilities in relation to two measures of print exposure: an author recognition test (ART) involving fiction authors and a reading habits questionnaire (RHQ) about children's voluntary reading for enjoyment across various genres. The ART correlated only with children's fiction book reading habits, not with other habits such as nonfiction book or magazine reading, and had a stronger relationship to all tested reading abilities than did the RHQ. Strong comprehenders in reading outperformed weak comprehenders on all component reading measures, ART score, and fiction habits; however, weak comprehenders scored higher than did strong comprehenders on the indicator of nonfiction reading habits. The two groups of comprehenders did not differ significantly on other reported reading habits. The results are discussed in relation to children's specific book choices and demonstrate the relevance of genre to evaluations of children's print exposure.

**Winskel and Iemwanthong (2010)** investigated reading and spelling development in Thai children, with an aim of examining the grain size that is predominantly used when reading and spelling. Furthermore, word and non word lists were developed to examine the acquisition of the complex system of vowels and tone rules in Thai. Reading and spelling of words and non words were assessed in 60 Thai children ranging in age from 7 to 9 years 8 months from Grade(s) 1, 2, and 3. A lexical effect was found for both reading and spelling. Spelling lagged behind reading in the Grade 1 children. Development rapidly increased between the youngest Grade 1 children and the older Grade 2 and 3 children. For word reading there were
significantly more lexical errors than phonological errors. Beginning readers appear to predominantly use a larger lexico-syllabic grain size to read Thai.

**Chappell et al. (2009)** summarized the results of a study involving 42 educational diagnosticians from North Texas. The study was conducted to determine diagnosticians' perceived understanding of early literacy development and their ability to effectively choose and interpret assessments of phonological awareness, phonemic awareness, and reading fluency. The results suggested that the educational diagnosticians who participated in the study were not sufficiently knowledgeable in identifying the numerous components of reading (e.g., phonological awareness, phonemic awareness, and fluency); nor were they prepared to choose appropriate assessment instruments to assess selected components of reading.

**De Graaff et al. (2009)** suggested that systematic phonics instruction appears to be more effective than nonsystematic phonics instruction for teaching reading (Ehri, Nunes, Stahl, & Willows, 2001). In the present study, a systematic phonics approach was directly compared with a nonsystematic phonics approach for kindergarten children. Both approaches were delivered using computer programs teaching the same Dutch grapheme-phoneme correspondences. Both phonics-trained groups progressed to the same extent on productive letter-sound knowledge compared to the control group. However, on measures of phonemic awareness, spelling, and reading, the systematic phonics group made more progress than the nonsystematic phonics group and the control group.

**Hock et al. (2009)** designed a study to examine 1) the level of proficiency in reading component skills of urban adolescent readers, and 2) whether these component reading skills were critical for proficient reading with
adolescent readers at the high-school level. As part of an IES funded descriptive study of selected reading component skills, 350 adolescents were administered a battery of component reading assessments. Specifically, student skills were assessed for passage comprehension, fluency, decoding, listening comprehension, and vocabulary. In addition, student scores on a state measure of reading proficiency were obtained for each of the participants. Additional assessments were obtained for student motivation for reading (Guthrie, 2004) and student overall level of hope for the future (Snyder, 1997). The overriding question associated with the descriptive was "How is performance on reading component measures (i.e., word decoding, word identification, fluency, vocabulary, comprehension, and motivation) related to proficiency on reading outcome measures?"

It is anticipated that the presentation and discussion will center on these analyses of the variables that affect reading proficiency in ASRs. They may yield important information on the relative effects of various reading components on overall reading performance.

- Teachers provide cognitive support through well-planned scaffolding and guidance;
- Teachers’ cognitive support was related to students’ motivation and reading;
- The observed instructional practices scale could act as a practical guide.

Loh and Tse (2009) investigated the relationships among Hong Kong Chinese students' reading attainment in Chinese and English, their attitudes toward reading, and their self-concept as readers. The sample consisted of 1,232 fourth-grade students from thirty-eight primary schools. Predictably, the students' reading attainment was better when tested in Chinese than in
English, their second language. On each test, girls tended to outperform the boys. It was hypothesized that students' Chinese and English reading self-concept and attitudes toward Chinese and English reading would correlate positively with their Chinese and English reading performance. However, no clear and easily interpretable pattern of relationships was found between students' reading attitudes, their self-concepts as readers, and their reading performance. Whereas item analysis showed the reading attainment measures to be highly internally consistent, the responses of the young children in the study to questionnaire probes, particularly to items concerned with self-concepts as readers, were less homogeneous. The paper explores the strength of the relationship between girls' and boys' scores on English and Chinese reading attainment tests, their attitudes toward reading in English and Chinese, and their self-concept as a reader in each language.

Musti-Rao et al. (2009) evaluated the effects of a repeated readings intervention with urban 4th-grade students who showed at-risk markers for reading failure. The authors trained the classroom teacher to implement repeated readings class-wise and collected treatment fidelity data on the extent to which the teacher adhered to the procedures. Results indicated that peer-mediated repeated reading improved students' oral reading rate across baseline levels; however, by the end of the study, the students did not reach benchmark goals in reading. Integrity data suggested that the teacher was able to implement the intervention with a high degree of fidelity class-wide. The authors discuss important implications for practice and directions for future research.

Rasinski et al. (2009) explored the role of reading fluency as a contributor to reading proficiency and difficulty among intermediate and middle grade students. They assessed reading fluency development among a large number of third-, fifth-, and seventh-grade students, using prosody...
(expressiveness in oral reading) rather than reading rate (word recognition automaticity) as a measure of reading fluency. They found moderately strong correlations between fluency and silent reading comprehension as measured by a standardized achievement test at all three grade levels. Their findings suggest that reading fluency appears to be a significant variable in upper elementary and middle grade students' reading. Moreover, the findings add to mounting evidence that prosody is an important component in the full manifestation of reading fluency. Both components of fluency, automaticity and prosody, should be considered in measures of reading fluency and in instructional methodologies for improving reading fluency. They suggest that more research is called for into the role of reading fluency among adolescent students, especially those students experiencing difficulty in achieving high levels of literacy.

Cramer and Rosenfield (2008) studied about the relationship of reading performance to difficulty level of material was the focus of this study. Participants in the study were 83 fourth graders from four urban schools. Each student was administered passages at different levels of challenge (independent, instructional, frustration) based on word identification accuracy. Passages were scored for word identification accuracy and rate. Comprehension was assessed through open-ended questions. There was a significant correlation between reading rate and word recognition accuracy. However, reading rate and comprehension did not correlate significantly. Implications of these findings for assessing reading progress for urban fourth grade students are discussed.

Thames et al. (2008) examined the effects of individualized, integrated language arts as a reading approach on struggling readers' comprehension scores obtained from oral narrative, silent narrative, and silent expository passages at three levels: below-grade, on-grade, and above-grade levels. Students (N = 93) in grades four through eight, who were reading below
grade level, participated in the study. Treatment group students (n = 51) received individualized, integrated language arts as a reading approach once a week in place of basal reading instruction. Comparison group students (n = 42) received basal reading instruction for the duration of the study. Multivariate analysis of covariance was used to analyze posttest Analytical Reading Inventory (ARI) comprehension scores. Several statistically significant (p less than 0.001) differences in comprehension performance were found for on-grade-level scores and for above-grade-level scores, but few differences were found between treatment and comparison groups on below-grade-level scores. All statistically significant differences favored students in the treatment group. The findings of the study strongly suggest that the use of individualized, integrated language arts as a method for teaching reading is an effective approach for improving the reading comprehension performance of struggling readers.

**Camp (2007)** explored reading habits across a wide range of students. An open-ended survey of reading habits involved 242 participants from grades 1, 4, 6, 8, 11, undergraduate non-education majors, undergraduate elementary majors, and graduate reading majors. As data were analyzed, themes emerged to categorize participant responses. Discussion of data offers suggestion to both teacher educators and classroom teachers about ways to develop and maintain the habit of reading.

**Glenberg et al. (2007a)** described that an embodied approach to reading comprehension suggests that emerging readers must learn to map words and phrases onto their remembered experiences, but this is made difficult by the necessity of focusing attention on decoding. Having children manipulate toys to correspond to what they are reading overcomes this problem, but introduces its own problem for the classroom, namely having to provide a classroom full of children with manipulative. In this article, we demonstrate that having first- and second-grade children manipulate
images of toys on a computer screen benefits their comprehension as much as physical manipulation of the toys. In addition, manipulation on one day facilitates reading in the same domain one week later. These findings encourage the use of manipulation of text-relevant images as an educational technology for enhancing early reading comprehension. The findings also set constraints on theoretical accounts of embodiment while reading.

Glenberg et al. (2007b) found that young readers manipulate objects to correspond to the characters and actions in a text greatly enhance comprehension as measured by both recall and inference tests. As a step toward classroom implementation, they applied this manipulation strategy in small (three-child) reading groups. For successive critical sentences, one child would read the sentence aloud and then manipulate the objects, then the next child would read and manipulate, and so on. Children in a reread control condition also alternated reading the text. For the reread condition, one child would read the critical sentence and then reread it, followed by the next child, and so on. Children who manipulated were substantially more accurate in answering questions about the texts. Thus, the manipulation strategy meets at least some of the criteria for being applicable in a classroom setting, namely it is effective when applied in small groups.

Broek et al. (2006) conducted a study to identify the cognitive profiles of struggling, average, and good readers at elementary, middle, and high school levels based on their reading comprehension processes. We collected think-aloud protocols and eye-tracking data from students as they were reading narrative and expository texts. In addition, students were tested using cognitive and reading-related assessments. Our aim is to use the cognitive profiles to design and test interventions targeting the diverse needs of students who struggle with reading comprehension. In this poster,
we present the cognitive profiles for 89 4th, 89 7th, and 90 9th grade students identified as struggling, average, or good readers using the reading comprehension measures. At each grade level, there were systematic differences between the cognitive processes in which struggling and average/good readers engaged. Moreover, analyses of the think-aloud data indicated that there were two subgroups of struggling readers in each grade. Struggling readers in one subgroup made reliably more inferences during reading, whereas those in the other group engaged in sentence-based processing, making more text repetitions/paraphrases.

Guthrie et al. (2006) investigated on the theoretical approach for increasing intrinsic motivation for reading consists of teachers using situational interest to encourage the development of long-term individual interest in reading. The authors investigated that possibility by using stimulating tasks, such as hands-on science observations and experiments, to increase situational interest. Concurrently, the authors provided books on the topics of the stimulating tasks and teacher guidance for reading to satisfy curiosities aroused from the tasks. Students with a high number of stimulating tasks increased their reading comprehension after controlling for initial comprehension more than did students in comparable intervention classrooms with fewer stimulating tasks. Students' motivation predicted their level of reading comprehension after controlling for initial comprehension. The number of stimulating tasks did not increase reading comprehension on a standardized test when motivation was controlled, suggesting that motivation mediated the effect of stimulating tasks on reading comprehension. Apparently, stimulating tasks in reading increased situational interest, which increased longer term intrinsic motivation and reading comprehension.

Clark and Graves (2005) explored the concept of instructional scaffolding as it applies to facilitating students' reading comprehension. They argue
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that scaffolding is a highly flexible and adaptable model of instruction that supports students as they acquire both basic skills and higher order thinking processes, allows for explicit instruction within authentic contexts of reading and writing, and enables teachers to differentiate instruction for students of diverse needs. The authors hope to help professionals gain a broader perspective of the different roles they can play in using various forms of scaffolding in the reading program, so that they will employ scaffolding more frequently in their classrooms and thereby improve their students' reading comprehension. Several definitions of scaffolding are considered, foundations of the scaffolding concept are reviewed, and reasons that scaffolding is an effective technique are discussed. Three general types of scaffolding are addressed: moment-to-moment scaffolding, instructional frameworks that foster content learning, and instructional procedures for teaching reading comprehension strategies. For each type, the authors provide two examples of instruction. Finally, they give things to consider when making decisions about scaffolding.

Leppanen et al. (2005) investigated the prospective relationships between reading performance and reading habits among Finnish children during the first and second grades of primary school. One hundred and ninety-five children were examined twice during their first primary school year and once during the spring term of Grade 2. The results showed, first, that children's reading skills predicted their reading habits: the more competent in reading children were at the end of Grade 1, the more likely they were to engage in out-of-school reading one year later. Second, reading habits also predicted reading skills: the amount of out-of-school reading at the end of Grade 1 contributed to the development of word recognition skills.

Manning (2005) expressed a concern that phonemic awareness is being viewed as a skill that is taught, rather than an ability that children develop as they become literate. Research has found that as children begin to read
and write, phonemic awareness and knowledge of phonics develop gradually and simultaneously. In this paper, the author shares what has been learned about how to quickly assess a child's phonemic awareness development and how to help students become more aware of individual phonemes.

**Glenberg et al. (2004)** conducted a study on object manipulation versus read-reread demonstrated that object manipulation can greatly enhance first and second graders’ reading performance. Students using the manipulation technique scored higher on critical action-sequence questions and temporal order questions than those who did not.

**Caposey and Heider (2003)** described a program for improving reading comprehension through cooperative learning. The targeted population consisted of elementary and middle school students in growing middle class communities, located in Northern Illinois. The problems of reading comprehension in content areas were documented through teacher observation and student test scores. Analysis of probable cause data revealed that students showed a needed improvement in reading comprehension related to retention of vocabulary. Faculty reported student difficulties in transfer of reading skills to content area subjects. This may have been due to a lack of vocabulary mastery. Reviews of instructional strategies demonstrated a need for improving teaching techniques. A review of solution strategies suggested by knowledgeable others, in addition to an analysis of the problem setting, demonstrated a need for the selection of an appropriate intervention: a cooperative learning technique designed to improve reading comprehension skills while mastering vocabulary. The intervention was implemented for a period of 10 weeks. During that time teachers repeatedly observed a cooperative atmosphere in their classrooms. Post-intervention data indicated improvement in mastery of vocabulary skills and reading comprehension using the cooperative
learning method of teaching. Educators, students, and parents were pleased with the success of the intervention.

**Gehring et al. (2003)** described a program for increasing students' language arts skills by incorporating modeling and grade appropriate comprehension activities. The targeted population consisted of Kindergarten, 4\textsuperscript{th} and 6\textsuperscript{th} grade students in a rural middle class community located in central Illinois. The problems with language arts skills were documented through motivational student surveys, comprehension assessment tools, and teacher checklists for literacy development. Literature review of solutions name reading strategies and instructional methods as ways to create solutions to the existing problems. Researchers focused on teaching students about reading logs, structural analysis, listening activities, predictions, context clues, comparisons, main ideas, using background knowledge and sequencing events. The researchers also included the use of guest readers, weekly visits to the library, and daily oral reading to motivate student interest in reading. The researchers collected data from students to reveal that this was an existing problem at the research sites. Students were given a Motivational Interest Survey and a Checklist for Assessing Literacy Development at the onset of the research in order to reveal how students felt about their language arts abilities. Students kept a reading log and completed weekly comprehension activities to show their progress and growth throughout the intervention period. At the end of the research project, students were given the motivational survey and assessed on their growth by the Motivational Interest Survey and a Checklist for Assessing Literacy Development. The post intervention data indicated an increase in student motivation to read and grade appropriate comprehension skills.

**Joshi et al. (2002)** provided an empirical demonstration that systematic, research-based reading instruction is crucial at the early elementary grade
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levels and that systematic synthetic phonics instruction in particular, instruction following the principles of the Orton-Gillingham method for the very early grades is effective in combating reading failure. In their one-year study of first graders, the authors found that multisensory teaching techniques that combined all three learning modalities-auditory, visual, and kinesthetic, first-grade students made significant gains in phonological awareness, decoding, and reading comprehension.

Jaise and Remya (2001) conducted a study on the relationship between reading speed and comprehension in English among Higher Secondary School Students. The investigators found that silent reading speed has no significant relationship with comprehension. On the other hand, it was found that loud reading speed has significant relationship with comprehension.

Trent and Truan (1997) studied the speed, accuracy and comprehension of adolescent Braille readers in a specialized school. The study of 30 adolescent Braille readers at the Tennessie School for the Blind found that the most important factor related to Braille reading speed was average at the onset of blindness. No direct relationships were found between reading speed and comprehension or reading speed and reading for pleasure in Braille.

Wang and Guthrie (1997) conducted three experiments focusing on understanding the information processes children use in learning to read Chinese, evaluating the learning differences between skilled and unskilled readers. To understand the strategies of character identification children use, participants in experiment 1, 10 Taiwanese elementary students (five skilled and five unskilled readers), were asked to read a story that they had not yet read. Results of these studies indicated that skilled readers used different strategies in identifying the unknown characters, relying on
phonetic cues more than unskilled readers; unskilled readers used graphic similarity more often than phonetic cues during character recognition.

**Udziela (1996)** examined whether sixth grade students taught formal study skills would obtain significantly higher reading achievement than those not taught these skills. Study skills can be broken down into ten or more skill areas including: study habits, time management, test taking, lecture note-taking, reading comprehension, vocabulary, test anxiety, textbook reading, reading speed, and memory. Subjects of the study were 181 sixth-grade middle school students from a Chicago suburb. Results indicated that teaching students formal study skills had no visible effect on their academic achievement.

**Kitao (1995)** made an investigation into the English reading ability of Japanese college students. The findings of the study suggest that:

- Students do not have enough experience dealing with a variety of literacy forms;
- It is better, particularly at the beginning, to teach students using short passage;
- It is important to work an increasing students’ reading speed; and
- It is important to teach students how to guess the meanings of unknown words from context.

**Kissel (1994)** made a multicase study on the compelling nature of recreational book reading in the lives of two adult readers and their reading communities. The study found that factor of gender, family, health and educational background influenced reading behaviors.

**Mac Donald (1994)** investigated the effects of a parent intervention training programme and its impact on reading achievement at the third grade level. The findings of the study suggest that the painful involvement programme using individually prescribed, meaning focused activities for
teaching reading was an effective means of improving reading comprehension skills of students.

Albano (1991) studied the effect of interest on reading comprehension and written discourse. From the total population, thirty average student’s data were randomly selected to be analyzed. The result was that interest did have a significant effect on the writing clarity variable and the reading comprehension variable.

Culver (1991) conducted a study on improving reading speed and comprehension of English as second language (ESL) students with computer. The results provide significant information about the effect of increasing reading speed on student comprehension levels through the use of the computer. It was concluded that the computer was good tool to improve student reading rate, although for some students, increased speed did not lead to increased levels of comprehension.

Marsh et al. (1991) made an examination on reading rate and comprehension of management personnel of a telecommunication company measured reading rate and comprehension of 39 Managers. The result showed that both increased after a one-week training programme to improve reading speed.

Skanthakumari (1987) studied on the ‘Development of Strategies for improvement of Reading skills in English at Middle school Level’ arrived at the conclusion that the intervention strategy helped to improve the reading ability of the students of both the high and low groups, the increase in the low group being higher than in the high group.

Devi (1986) conducted a study based on strategies for developing critical reading abilities in higher secondary school students in English. The major findings were
The students of the target group were able to improve their critical reading ability through the strategy implemented, which proves the effectiveness of the strategy; and

There was relationship between achievement scores and critical reading achievements.

**Duffy et al. (1986)** examined the relationship between explicit teacher explanation and student awareness of lesson content and reading achievement gains. Subjects were seven fifth-grade teachers and their respective low-reading ability groups. The teachers were taught how to modify basal text prescriptions for a particular skill so that students would learn to use it as a strategy for discovering meaning rather than as a memorization exercise. In addition, the teachers were taught how to organize and structure a lesson so that students were explicitly introduced to a skill, had a model to follow, and were guided in applying it in a "real text." Data were collected by means of audiotapes of lessons and teachers' perceptions of the training they had received, student interviews, and pretests and posttests of student achievement. Results support earlier findings that teachers can be trained to be more explicit in their explanations and that such explicitness is related to improved student awareness of lesson content.

**Patel (1985)** studied the impact of reading improvement programme in Gujarat for pupil of class VII in the context of some psycho-socio variables. The findings were

The mean difference of the reading comprehension occurs of students of the experimental and control groups were highly significant and was in favour of the experimental group;
The RIP was found to be effective in the case of students with high and low I.Q, and students coming from high and socio-economic status; and

RIP was effective for increasing the speed of reading students

Armbruster and Gudbrandsen (1984) examined five social studies programs at the fourth and sixth grade levels to determine how much and what kind of reading comprehension instruction was provided in both the students' and teachers' editions of the texts. Programs studied were those published by Follett; Harcourt, Brace, Jovanovich; Laidlaw; Macmillan; and Scott, Foresman. Results showed that publishers of four of the five programs acknowledged the importance of reading in the social studies curriculum and purported to teach reading-related skills. However, there was little direct instruction of these skills, and what little instruction there was often seemed inadequate. The programs relied primarily on having students practice or apply skills without the benefit of instruction in how to do this. This situation may stem from (1) the confusion regarding what "reading skills" really are, (2) the fact that what is known about teaching reading comprehension is not finding its way into the social studies programs, and (3) the fact that really good instruction in content area reading takes time to develop and time to practice.

Das (1984) studied the reading comprehension in English of students of English medium schools of Std. X of Central Gujarat. The findings were as follows:

- The mean scorers of girls was higher than that of boys
- The mean difference of reading comprehension scores was in favour of students with high socio-economic status.
- Students having a low anxiety level had better reading comprehension than those with a high anxiety level.
Shelat (1984) conducted a study on the impact of reading improvement programme in Gujarat on reading comprehension of pupils of class VI. He found out that the experimental group showed a better performance in the reading speed and comprehension after faking RIP than the control group. He concluded that RIP was effective and could be used to improve reading comprehension of pupils with high as well as low IQ and for pupils coming from high as well as low SES.

Gaur (1982) made a psychological study of reading ability in relation to achievement. These are the major findings:

- The speed of reading, comprehension and vocabulary affected the student’s achievement in Hindi as well as the aggregate achievement.
- Economic status, the standard of school and sex were not significantly related to comprehension and vocabulary, but was significantly related with speed in reading.
- Intelligence was significantly related to speed in reading, comprehension and vocabulary of students.

Shivapuri (1982) made an investigation into pupil’s comprehension of English. He found out that there was no difference in comprehension scores for the sexes. Socio-economic status affected the comprehension scores only in the case of girls, the upper class girls scoring higher than the lower class groups.

Snow (1982) investigated on the instructional techniques that facilitate children's acquisition of reading comprehension skills in the middle and upper elementary grades. The initial focus of the study was on methods of assessment. Analytic inquiry focused on strategy differences between good and poor readers and remediation techniques for teaching comprehension skills beyond the word level. Following the analytic inquiry, a series of
three empirical studies investigated an important but not widely studied aspect of reading skills development - children's perception of meaningful, intra-sentence units in printed discourse. These studies found that (1) phrasally segmented text improved children's oral reading in regard to appropriate intonation, stress, and pauses; (2) both good and poor readers were able to use prosodic features in order to identify functional intra-sentence units in speech, but poor readers had difficulty compensating for the lack of these organizing cues in printed text; and (3) oral modeling of text helped moderately poor readers to read out loud in a fluent manner, suggesting an improved understanding of text. These results suggest that auditory language skills should also be used as the basis for teaching children to analyze the phonological and structural organization of text on the larger level of phrases and sentences.

Aggarwal (1981) examined the role of some of the personal, cognitive and non-cognitive factors in reading ability. He found out that males and females differed significantly in reading ability, study habits, academic achievements, extroversion, parental attitude and ideal self. Females scored higher than males in reading ability and academic achievement.

Ahuja (1975) conducted an investigation to find out whether fast readers comprehend better and fast silent reader is fast oral reader too. The results of the study reveal that:

- Fast silent reader comprehends better in comparison to slow silent reader. The fast readers are decidedly good readers because they comprehend more in lesser time.
- The slow silent readers are prone to vocalization, where as very few fast readers show such symptoms
- Fast silent readers are fast oral readers and slow silent readers are also slow oral readers.
3.2 LITERATURE ON MENTAL MODELS

Guo-Li (2013) viewed that, although prediction is claimed to be a prime function of mental models, it remains uncertain to what extent students can run their mental models to make predictions of physical phenomena, remains uncertain. The purpose of this study, therefore, was first to investigate the mental models of heat convection among 30 physics students and then to examine the relationship between their mental models and predictions of convection-related phenomena. A series of semi-structured interviews was conducted to probe the participants' mental models and predictions of heat convection, and the constant comparative method was adopted for data analysis. The results reveal that the participants held a variety of mental models of heat convection, and nearly half of them held flawed mental models rather than a scientifically compatible one. In addition, while many participants attempted to run their mental models to make a prediction at the beginning stage of solving an interview problem, the relationship between the models and predictions became increasingly complex as the problem solving process continued. The relationships between mental models and predictions, however, could be better understood by considering the completeness of a mental model, the scale of analyzing mental models, and the retrieval of different formats of mental representations.

Laura (2013) offers a robust definition of an individual mental model for use in organizational management. The approach adopted involves an interdisciplinary literature review of disciplines, including system dynamics, psychology, cognitive science and organizational learning. It was found that critical reflection on the published individual mental model definitions revealed similarities and shortcomings. It is argued that here the literature presents some consensus in the concept being internally held and having the capacity to affect how a person acts. The proposed
definition of an individual mental model was found to be robust through a complexity based inquiry conducted in an organisation within the hospitality industry. The application of the model has only been tested in one case study with a small staff sample in the hospitality industry. Thus generalisation is limited pending further testing. The pilot study demonstrated the usefulness of the definition of an individual mental model in making the conceptualisations of work practices explicit at various levels within organisations. The paper produces a definition that is lucid, inclusive, and specific for mental model research and knowledge management in organisations. The paper provides added value for academics and organisational practitioners interested in a robust definition for understanding the concept and the implications of mental models on an individual's actions.

**Norbert and Ifenthaler (2013)** focused on mental models and their application to inductive reasoning within the realm of instruction. A basic assumption of this study is the observation that the construction of mental models and related reasoning is a slowly developing capability of cognitive systems that emerges effectively with proper contextual and social support. First, some key elements of the structure and function of mental models is identified in contrast to schemas. Next, these key elements of modeling are used to generate some conjectures about the foundations of model-based reasoning. In the next section, the learning-dependent progression of mental models is described as a suitable approach for understanding the basics of deductive and inductive reasoning based on models as "tools for thought." The rationale of mental models as tools for reasoning are supported by empirical research described in the paper. Finally, the instructional implications of model-based reasoning are discussed with appropriate instructional methods to
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Affect the construction of mental models for performing deductive and inductive reasoning.

**Parveen and Rajesh (2013)** viewed that in schools and colleges, reading comprehension is taught and tested. However, students lack reading fluency because they never practise reading at school or home. They are haunted by the media, and don't have interest in reading. Due to internal and external factors, they are deficient in reading readiness, reading attitude, reading comprehension, etc. They don't know the reading strategies or techniques for effective reading. They just memorise the answer choices and write the answers in the exams. They don't realise the importance of reading until they have to read and understand a lot of information in higher education and work environments. Mental models are symbolic representations of how the mind holds abstract information. They can be in the form of pictures, gestures, analogies, concept maps, story webs, etc. Mental modelling can be used to enhance the reading process. Teachers can use guided reading or paired reading in the classrooms to develop mental modelling which in turn will boost up the reading readiness, reading attitude, reading comprehension, and reading fluency of the students. An experimental study was conducted in VV College of Engineering to check whether guided reading and paired reading help the students in developing mental modelling which enhances their reading skills.

**Yamashita (2013)** viewed that the mental models theory suggests that people make reasoning errors because they construct partial - and inaccurate – mental models. It predicts that where people are required to consider false information, they are more prone to making errors than when they are only required to consider true information. Findings consistent with this theory have been demonstrated across a number of studies, particularly the work of Johnson-Laird. However, researchers...
suggested that these findings are better explained by a linear separability effect. That is, problems are easier to solve when they are linearly separable than when they are nonlinearly separable. That is, the simplicity and precision with which correct and incorrect answers can be separated determines the extent to which they will be solved correctly. This literature review examines research on mental models and linear separability published between 2000 and 2012, to establish if this explanation has been proposed by other researchers. Results indicate that no other researchers have proposed this, or similar, explanations, hence the linear separability hypothesis has the potential to make a novel contribution to the literature.

Wilke and Losh (2012) examined conceptual change in pre-service teachers through a synthesis and application of mental models theory. They analyzed longitudinal data in the form of lesson plans, interviews, and written rationales from eight social science pre-service teachers. Findings illustrate how pre-service teachers' mental models changed during their coursework are graphically presented. Pre-service teachers' mental models developed from general to discipline-specific practices. However, their conceptions of how students learn continued to focus on learner types rather than learning processes, suggesting a need for an ontological shift. The authors discuss implications for mental models theory and future research in teacher education.

Woolley (2011) discussed that when most children read narrative texts they actively utilize cognitive resources to comprehend by constructing appropriate mental models of story events. However, many children with poor comprehension experience difficulties due to an inability to appropriately direct attention and to effectively use the resources of working memory. As a result, their ability to construct integrated mental models of story content may be impaired. However, their reading
comprehension performance can be improved when they are taught inferential reading comprehension strategies involving both verbal and visual processes to facilitate more elaborated mental modeling of narrative texts. This article discusses how such strategies can be implemented and consolidated using a metacognitive focus within a flexible multiple-strategy framework.

Pani (2003) observed that focus in recent times on realistic pedagogy implies that one can no longer depend on a transmission model of training, either for teachers or learners. One needs to develop strategies that will help teachers and learners to be co-participators in the learning process. Mental modelling is one technique suggested in this article. It is a technique through which the teacher demonstrates the mental processes of a ‘superior’ reader while s/he makes sense of the text. Since this makes the process of reading ‘visible’ it is easy for the learners to imitate the steps. Data was collected through transcripts of group discussions, mental modelling of the tutor, and retrospective notes of the tutor. Findings from the study showed that mental modelling can be an effective pedagogic strategy in Indian classrooms in terms of motivating the learners to develop improved reading strategies.

Tversky (1993) described that although cognitive map is a popular metaphor for people's mental representations of environments, as it is typically conceived, it is often too restrictive. Two other metaphors for mental representations are proposed and supported. Cognitive collages are consistent with research demonstrating systematic errors in memory and judgment of environmental knowledge. Yet, for some simple or well-known environments, people seem to have coherent representations of the coarse spatial relations among elements. These spatial mental models allow inference and perspective taking but may not allow accurate metric judgments.
3.3 LITERATURE ON MULTIPLESTRATEGY INSTRUCTION

Bolukbas et al. (2011) carried out a study to identify the efficiency and the effects of cooperative learning techniques on the reading skills of the students who learn Turkish as a second language. A total of 40 students (20 subjects in experimental group, 20 subjects in control group), who learn Turkish as a second language at Istanbul University Language Center, participated in this study which was done in accordance with the ‘pre-test post-test control group’ model as one of the experimental research designs. In the experimental group, cooperative learning techniques were used for reading comprehension activities, while traditional teaching model was followed in the control group. The data were gathered through the ‘Reading Comprehension Skills Achievement Test’ developed by the researchers, and a number of suggestions were made to develop reading skills in teaching Turkish as a foreign language.

Brown et al. (2009) explored how well the use of mental models would be likely to support the dynamic decision-making process. With respect to the dynamic decision maker, the mental models literature contains vague descriptions of the exact mental models processes used by decision makers. In addition, the literature suggests a number of inherent limitations of decision-makers in being able to form and apply mental models, such as cognitive limitations, mental effort, heuristics, and biases. Similarly, the nature of DDM environments (i.e., complexity, feedback) and DDM tasks (i.e., time, uncertainty) are unlikely to support the use of mental models to make decisions. However, this does not mean that mental models cannot be helpful, simply that the limitations of whatever models can be formed should be recognized.

Glenberg et al. (2007), Glenberg et al. 2004), and Joshi et al. (2002) provided an empirical demonstration that systematic, research-based
reading instruction is crucial at the early elementary grade levels and that systematic synthetic phonics instruction - in particular, instruction following the principles of the Orton-Gillingham method - for the very early grades is effective in combating reading failure. In their one-year study of first graders, the authors found that multisensory teaching techniques that combined all three learning modalities - auditory, visual, and kinesthetic, first-grade students made significant gains in phonological awareness, decoding, and reading comprehension. However, first grade students in the control group also made significant gains in reading comprehension.

Paris and Paris (2007) demonstrated that comprehension by first graders, even by students who cannot decode well, can be promoted through explicit instruction in reading strategies and text structure. They found that instruction in narrative thinking benefited students’ comprehension of narratives in the picture-viewing modality as well as narrative meaning-making in listening comprehension and oral production modalities. That is, students participating in the experimental group showed better understanding of explicit pictorial information and were more able to make conclusions about implicit pictorial information. They also improved in listening comprehension and recall of main narrative elements, in recall of main story elements, and were more able to ascribe dialogue to characters. From pre- to post-test, students in the experimental group showed improvements in recall, in the ability to organize main story elements, in understanding explicit pictorial information, and in making more accurate inferences about implicit pictorial information. For most of these variables, the students in the experimental groups had lower scores at pre-test and caught up and even surpassed the comparison students at post-test. Thus, comprehension instruction that minimizes decoding demands can provide direct benefits
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to students before and as they learn to read. The Paris and Paris study showed the benefits of direct comprehension instruction for young students with both high and low decoding skills. Teachers should design beginning reading practices that foster narrative thinking skills for all students, regardless of ability.

Glenberg et al. (2006) also found that object manipulation had a positive effect on students’ reading comprehension when used in smaller groups. This was true for students in both individual and peer settings. Object manipulation appears to help students draw inferences necessary to construct integrated mental models. A mental model is often conceptualized as a representation that goes beyond information explicit in the text by incorporating a student’s inferences and world knowledge: thus the mental model becomes a representation of what the text is about rather than a representation of the text itself. This research has demonstrated an approach to language comprehension - the use of physical manipulation and even imagined manipulation - that suggests a powerful teaching technique. However, before recommending this technique for classroom use, researchers must demonstrate that it works with longer and more realistic texts and that the results of using the technique do not fade as students become more familiar with the process. Furthermore, research needs to demonstrate that students can be taught to move from physical representations of story-relevant objects to mental images.

Teaching students specific reading strategies, such as finding the main idea, summarizing, and analyzing text structure - and when to use them - helps students become successful readers. Metacognitive strategies concern the reader’s planning, monitoring, and evaluation of the tasks at hand. The following seven categories appear to provide a scientifically based foundation for the improvement of comprehension:
Comprehension monitoring: Students learn how to be aware of their understanding of the material

Cooperative learning: Students learn reading strategies reciprocally

Use of graphic and semantic organizers: Students generate representations of the material to assist comprehension

Question answering: Students respond to questions posed by the teacher and receive immediate feedback

Question generation: Students ask themselves questions about various aspects of the text

Story structure: Students are taught to use the structure of the story as a means of helping them recall story content in order to answer questions about what they have read

Summarization: Students are taught to integrate ideas and generalize from the text information

The findings also suggest that these techniques, when used in combination, can be effective in improving comprehension of other content areas and standardized comprehension tests. Results from this current review of the research demonstrate that how teachers teach reading is very important. Teachers who engage their students in learning to read, provide small group instruction and explicit skill instruction in comprehension, and provide modeling and coaching yield students with better outcomes in learning to read.

Guthrie et al. (2006) demonstrated that combining motivation practices with strategy instruction in comprehension increases reading comprehension. Several studies also demonstrated that beginning readers were able to successfully transfer knowledge of comprehension strategies from one literacy activity to another after repeated exposure, explicit explanation, teacher modeling, and questioning.
Results from this review should inform both pre- and in-service teacher professional development. Teacher training should prepare teachers to engage students strategically rather than mechanically in approaching comprehension tasks. While our understanding of word recognition skills has grown dramatically, our knowledge of how to develop oral language and background knowledge to foster reading comprehension remains limited. More attention must be paid to elementary students’ comprehension skills. The field needs more research on comprehension interventions that are scientifically valid and practical as well as more information on the precursors of comprehension and how reading comprehension develops.

Their views also confirmed that a high number of stimulating tasks increased student motivation and that motivation has a positive effect on reading comprehension. The tasks must be integrally connected to the content of texts and students’ interests to increase motivation. Reading comprehension instruction that explicitly combines motivation practices with strategy instruction increases reading comprehension compared with strategy instruction alone or traditional instruction.

**Van Keer and Verhaeghe (2005)** combined explicit strategy instruction and whole-class activities with cross-age tutoring and same-age peer-tutors. Second-grade students who received explicit strategy instruction and then practiced reading with cross-age (fifth-grade) tutors made similar gains to students who practiced under direct teacher supervision.

**Williams et al. (2005)** studied an intervention based on instruction in text structure by improved students’ abilities to comprehend compare and contrast texts. Students who received the intervention also demonstrated transfer to uninstructed compare and contrast texts: they not only learned
what they were taught but were also able to transfer that knowledge for use with new content.

**Garner and Bochna (2004)** demonstrated that novice readers were able to transfer knowledge from one literacy activity to another after exposure to instructional strategies that used repeated presentation, explicit explanation, teacher modeling, and questioning. At post-test, the intervention group demonstrated significantly higher listening comprehension than did the comparison group; these students also demonstrated superior comprehension in relation to each of four story elements and displayed metalinguistic awareness of text structure by labeling and giving examples of story structure concepts more frequently. Not only did students transfer story grammar knowledge and use it successfully in a different context from the one in which they gained and practiced it, they transferred the knowledge in the context of a more difficult task than the one in which they initially acquired the knowledge. However, in this instance, the success of story grammar instruction in supporting listening and reading comprehension was complicated by the lack of students’ improvement in story retelling. It may be that text structure knowledge serves a specific purpose and may support the formation of an enduring situational model rather than a text base. Knowledge of text structure may promote long-term organization, retention, and retrieval rather than facilitating the immediate and temporary formation of a mental representation depicting a text’s progression.

**Glenberg et al. (2004)** conducted a study on object manipulation versus read-reread demonstrated that object manipulation can greatly enhance first and second graders’ reading performance. Students using the manipulation technique scored higher on critical action-sequence questions and temporal order questions than those who did not.
Guthrie et al. (2004) investigated Concept-Oriented Reading Instruction (CORI) which combines strategy instruction with motivation supports. Motivation supports included giving students choices, hands-on activities, and interesting text. Results indicated that students in the CORI classrooms were more motivated than were students who received only strategy instruction or traditional instruction. Furthermore, students in the CORI classrooms were more strategic readers than were students in the strategy instruction-only classrooms.

Williams and Lauer (2004) found that text structure, content familiarity, and reading comprehension ability affect student performance. To determine whether instruction in text structure helps second-grade students improve their comprehension of compare and contrast expository text, the authors randomly assigned students to one of two text conditions: narrative sequence or text structure sequence. A third group of students served as a control. Students who received text structure instruction achieved significantly higher scores in recalling and identifying clue words and generating oral and written sentences than did students in the two other groups. There was no difference among the groups in recalling three compare and contrast questions. Nor was there a difference among groups in students’ proficiency in the use of a graphic organizer (all achieved relatively high scores), suggesting second graders’ familiarity with the strategy.

In a related study, second graders of both low and high comprehension ability were found to be sensitive to expository text structure and could benefit from instruction in text structure (Williams, et al. 2004, 2005). Similar findings by Hall, Sabey, and McClellan (2005) suggest that teaching text structure is an effective strategy for promoting expository text comprehension by second-grade students. Hall and colleagues found that students who received text structure training were able to use two
expository text comprehension strategies effectively: that is, they gained a conceptual understanding of compare and contrast and produced better structured summaries than did students who received content-only instruction or no instruction.

Taylor et al. (2003) studied about the method by which a teacher teaches comprehension (mechanically or strategically) is important in ensuring the effectiveness of comprehension instruction. Observations of teachers several times over the course of a school year by Taylor, Pearson, Peterson, and Rodriguez suggested that teaching variables such as small-group instruction, skill instruction in comprehension, teacher modeling, and coaching for teachers explained substantial variation in student achievement. The most consistent finding was that teachers who emphasized higher-order thinking promoted greater reading growth.

A secondary finding suggested that routine, practice-oriented approaches to teaching important comprehension processes resulted in a lower growth rate of students’ reading comprehension than did strategic approaches; in fact, the more routine-practice approaches observed, the lower students’ growth in reading comprehension. Strategic approaches to comprehension processes, rather than mechanical ones, also correlate positively to first-graders’ writing growth.

Taken together, these findings suggest that awareness of text structure appears to improve students’ comprehension of expository texts. They also suggest that young students experience greater difficulty with unstructured text and need appropriate and extensive exposure to expository texts with frequent opportunities to employ comprehension strategies. Introducing expository text in the elementary grades would thus be useful. If texts are to be used in content areas, it might be beneficial to present them first in a narrative structure, which the young readers found easier to understand.
Findings also indicate that training in a single text structure does not improve students’ ability to handle another text structure (Williams, et al. 2005); therefore it may be necessary to provide explicit instruction on each individual structure.

CONCLUSION

The above review of literature helped to gather extensive information on Reading Skill, Mental Modelling and Multiple Strategy Instruction. This helped to frame the research design, to formulate the hypotheses and objectives of the study, to select the method, to develop tools for the present investigation and to conduct the study. This review also throws light on the relevance of the present study.