

**IMPACT OF VERBAL WORKING MEMORY ON  
ACHIEVEMENT MOTIVE, ACADEMIC PERFORMANCE  
AND STUDY HABITS AMONG STUDENTS**

वाचीक कार्यशील स्मृति का विद्यार्थियों की उपलब्धि अभिप्रेरणा, अकादमिक  
निष्पादन एवं अध्ययन आदतों पर प्रभाव

**A  
Thesis**

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By  
**BENAZIR SHAFAT HUSSAIN**  
बेनज़ीर शफाअत हुसैन

Under the supervision of:

**Dr. DEEPIKA JAIN**  
Assistant Professor  
Pacific Academy of Higher  
Education & Research University, Udaipur



**FACULTY OF SOCIAL SCIENCE & HUMANITIES  
PACIFIC ACADEMY OF HIGHER EDUCATION  
AND RESEARCH UNIVERSITY, UDAIPUR  
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# CHAPTER - V

## CONCLUSION AND SUGGESTIONS

The present chapter is related with conclusion and suggestions. The conclusions are systematically segmented into five sections. The first section is related with the conclusions related with verbal working memory. The second section deals with conclusions related with achievement motivation. The third section deals with conclusions related with academic performance. The fourth section deals with conclusion related with study habits and the fifth section is related with hypotheses testing.

Furthermore, the suggestions are also segmented into five parts. The first four parts are related with improvement/ enhancement of verbal working memory, achievement motivation, academic performance and study habits. The fifth part is related with the suggestions for further research. At last, the practical implications of the research are written.

### **5.1 Conclusion related with Verbal working memory**

- Verbal working memory for boys and girls is average.

### **5.2 Conclusions related with Achievement Motivation**

- Boys and Girls possess average level of Achievement motivation.
- Students having low level of verbal working memory have average Achievement Motivation.
- Students having average level of verbal working memory have average Achievement Motivation.
- Students having high level of verbal working memory have average Achievement Motivation.
- Boys with low verbal working memory have low Achievement Motivation.
- Boys with average verbal working memory have average Achievement Motivation.
- Boys with high verbal working memory have average Achievement Motivation.
- Girls with low verbal working memory have average Achievement Motivation.
- Girls with average verbal working memory have average Achievement Motivation.
- Girls with high verbal working memory have high Achievement Motivation.
- There is a significant difference in level of achievement motivation of boys and girls.

- There is a significant difference in level of achievement motivation of students with different levels of verbal working memory.
- The girls have significantly higher achievement motivation in comparison to boys.
- Students with average verbal working memory have significantly higher achievement motivation in comparison to students with low verbal working memory.
- Students with high verbal working memory have significantly higher achievement motivation in comparison to students with low verbal working memory.
- Students with high verbal working memory have significantly higher achievement motivation in comparison to students with average verbal working memory.
- Boys with average verbal working memory have significantly higher achievement motivation in comparison to boys with low verbal working memory.
- Boys with high verbal working memory have significantly higher achievement motivation in comparison to boys with low verbal working memory.
- Boys with high verbal working memory have similar achievement motivation to boys with average verbal working memory.
- Girls with average verbal working memory have significantly higher achievement motivation in comparison to girls with low verbal working memory.
- Girls with high verbal working memory have significantly higher achievement motivation in comparison to girls with low verbal working memory.
- Girls with high verbal working memory have significantly higher achievement motivation in comparison to girls with average verbal working memory.
- Girls with low verbal working memory have significantly higher achievement motivation in comparison to boys with low verbal working memory.
- Girls with average verbal working memory have significantly higher achievement motivation in comparison to boys with average verbal working memory.
- Girls with high verbal working memory have significantly higher achievement motivation in comparison to boys with high verbal working memory.
- There is a significant association between gender and achievement motivation.
- There is a significant association between verbal working memory levels and achievement motivation.
- There is a significant positive correlation between verbal working memory and achievement motivation for boys.

- There is a significant positive correlation between verbal working memory and achievement motivation for girls.
- There is a significant positive correlation between verbal working memory and achievement motivation for total sample.

### **5.3 Conclusions Related with Academic Performance**

- Boys and Girls possess average level of Academic performance.
- Students having low level of verbal working memory have low level of Academic performance.
- Students having average level of verbal working memory have average level of Academic performance.
- Students having high level of verbal working memory have high level of Academic performance.
- Boys with low verbal working memory have low level of Academic performance.
- Boys with average verbal working memory have average level of Academic performance.
- Boys with high verbal working memory have high level of Academic performance.
- Girls with low verbal working memory have average level of Academic performance.
- Girls with average verbal working memory have average level of Academic performance.
- Girls with high verbal working memory have high level of Academic performance.
- There is a significant difference in level of academic performance of boys and girls.
- There is a significant difference in level of academic performance of students with different levels of verbal working memory.
- The girls have significantly higher academic performance in comparison to boys.
- Students with average verbal working memory have significantly higher academic performance in comparison to students with low verbal working memory.
- Students with high verbal working memory have significantly higher academic performance in comparison to students with low verbal working memory.

- Students with high verbal working memory have significantly higher academic performance in comparison to students with average verbal working memory.
- Boys with average verbal working memory have significantly higher academic performance in comparison to boys with low verbal working memory.
- Boys with high verbal working memory have significantly higher academic performance in comparison to boys with low verbal working memory.
- Boys with high verbal working memory have significantly higher academic performance in comparison to boys with average verbal working memory.
- Girls with average verbal working memory have significantly higher academic performance in comparison to girls with low verbal working memory.
- Girls with high verbal working memory have significantly higher academic performance in comparison to girls with low verbal working memory.
- Girls with high verbal working memory have significantly higher academic performance in comparison to girls with average verbal working memory.
- Girls with low verbal working memory have significantly higher academic performance in comparison to boys with low verbal working memory.
- Girls with average verbal working memory have significantly higher academic performance in comparison to boys with average verbal working memory.
- Girls and Boys with high verbal working memory have similar level of academic performance.
- There is a significant association between gender and academic performance.
- There is a significant association between verbal working memory levels and academic performance.
- There is a significant positive correlation between verbal working memory and academic performance for boys.
- There is a significant positive correlation between verbal working memory and academic performance for girls.
- There is a significant positive correlation between verbal working memory and academic performance for total sample.

#### **5.4 Conclusions Related with Study Habits**

- Boys and Girls possess average level of Study habits.
- Students having low level of verbal working memory have low level of Study habits.

- Students having average level of verbal working memory have average level of Study habits.
- Students having high level of verbal working memory have average level of Study habits.
- Boys with low verbal working memory have low level of Study habits.
- Boys with average verbal working memory have average level of Study habits.
- Boys with high verbal working memory have average level of Study habits.
- Girls with low verbal working memory have average level of Study habits.
- Girls with average verbal working memory have average level of Study habits.
- Girls with high verbal working memory have high level of Study habits.
- There is a significant difference in level of study habits of boys and girls.
- There is a significant difference in level of study habits of students with different levels of verbal working memory.
- The girls have significantly higher study habits in comparison to boys.
- Students with average verbal working memory have significantly higher level of study habits in comparison to students with low verbal working memory.
- Students with high verbal working memory have significantly higher level of study habits in comparison to students with low verbal working memory.
- Students with high verbal working memory have significantly higher level of study habits in comparison to students with average verbal working memory.
- Boys with average verbal working memory have significantly higher level of study habits in comparison to boys with low verbal working memory.
- Boys with high verbal working memory have significantly higher level of study habits in comparison to boys with low verbal working memory.
- Boys with high verbal working memory have significantly higher level of study habits in comparison to boys with average verbal working memory.
- Girls with average verbal working memory have significantly higher level of study habits in comparison to girls with low verbal working memory.
- Girls with high verbal working memory have significantly higher level of study habits in comparison to girls with low verbal working memory.
- Girls with high verbal working memory have significantly higher level of study habits in comparison to girls with average verbal working memory.

- Boys and Girls with low verbal working memory have similar level of study habits.
- Girls with average verbal working memory have significantly higher level of study habits in comparison to boys with average verbal working memory.
- Girls and Boys with high verbal working memory have similar level of study habits.
- There is a significant association between gender and study habits.
- There is a significant association between verbal working memory levels and study habits.
- There is a significant positive correlation between verbal working memory and study habits for boys.
- There is a significant positive correlation between verbal working memory and study habits for girls.
- There is a significant positive correlation between verbal working memory and study habits for total sample.

### 5.5 Hypotheses Testing

1. ***“There is no significant difference in achievement motive between boys and girls” – failed to be accepted***

The analysis reveals a significant difference between boys and girls regarding achievement motive, refuting the initial hypothesis and prompting a reconsideration of gender-related dynamics in this context.

2. ***“There is no significant difference in academic performance between boys and girls” - failed to be accepted***

The study reveals a significant difference between boys and girls regarding academic performance, rejecting the initial hypothesis.

3. ***“There is no significant difference in study habit between boys and girls” – failed to be accepted.***

The analysis reveals a significant difference between boys and girls regarding study habit, refuting the initial hypothesis.

4. ***“There is no significant effect of verbal working memory on achievement motive” – failed to be accepted.***



The research findings demonstrate a noteworthy effect of verbal working memory on achievement motive, refuting the initial hypothesis and emphasizing the importance of verbal working memory in shaping achievement motive.

5. ***“There is no significant effect of verbal working memory on academic performance” – failed to be accepted.***

The study findings demonstrate a significant effect of verbal working memory on academic performance, rejecting the initial hypothesis.

6. ***“There is no significant effect of verbal working memory on study habit” – failed to be accepted.***

The research findings demonstrate a significant effect of verbal working memory on study habits, rejecting the initial hypothesis.

# CHAPTER – VI

## INTERVENTIONS, SUGGESTIONS & PRACTICAL IMPLICATIONS

### **6.1 Interventions & strategies to improve working memory & verbal working memory**

The cognitive function known as working memory is the part of our minds that is responsible for briefly storing and manipulating the information we encounter. It is an essential component in a wide range of activities, including as learning, problem-solving, decision-making, and concentration, among others. Listed below are some ideas that can help boost your working memory and verbal working memory:

**Chunking:** The process of chunking involves breaking down more complicated information into more manageable and useful pieces. It is possible to make knowledge easier to recall as well as modify if you divide it up into smaller groups and organize it. As an illustration, rather than attempting to recall a big list of numbers, try organizing the numbers into meaningful sets.

**Visualization:** involves forming mental images for the purpose of improving memory and recall. Imagine the information that you need to remember, connect it to clear images, and work on making connections between the images in a way that will stick in your mind. The performance of one's working memory can be improved with the use of visual clues.

**Mnemonic devices:** Encode information using mnemonic techniques so that it is more easily retained in your memory. Mnemonics are any device, such as an acronym, rhyme, or visualization approach, that establishes an easily recallable connection between a piece of new information and prior information.

**Memory exercises:** Participate in tasks that have been created exclusively for the purpose of testing and exercising your working memory. Memory exercises, brain games, and puzzles such as memorizing lists, playing memory card games, or completing Sudoku might help you boost the quantum of information which can be stored in your working memory.

**Mindfulness:** The practice of mindfulness can help improve focus and attention, which are essential for working memory. Mindfulness meditation and other approaches can be found online. Your ability to concentrate, the number of distractions you can tolerate, and your level of cognitive control can all increase with regular practice of mindfulness.

**Getting enough sleep:** A sufficient amount of sleep is essential for the consolidation of memories and the enhancement of cognitive function, particularly working memory. Sleep plays a critical role in these processes. Make getting enough sleep as a top priority so that your brain can process and remember knowledge as efficiently as possible.

**Staying Active:** Maintaining an active lifestyle is important since research has shown that regular exercise has a beneficial effect on cognitive performance, particularly working memory. Take part in physical activities that will raise your heart rate; research has shown that aerobic exercise in particular is associated with positive effects on cognition.

**Multitasking:** Reduce your use of numerous tasks because doing so can put a burden on your working memory because it forces you to frequently switch your attention and keep track of multiple pieces of information at the same time. Make an effort to concentrate solely on one undertaking at a time to lighten your mental load and boost the capacity of your working memory.

**Use external memory aids:** Engage other resources to offload some of the demands placed on your working memory, and make use of external memory aides. Make use of tools such as timetables, to-do lists, alerts, and digital note-taking applications to assist you in remembering crucial information and activities. This will enable your working memory to concentrate on more pressing concerns.

**Stay organized:** By keeping both your digital and physical areas neat and tidy and by maintaining an environment that is organized. Your working memory will be able to function at a higher capacity if you keep your workspace organized, which will limit distractions and make it easier for you to concentrate.

### **Activities to improve Verbal working memory**

Activities such as listening comprehension, following instructions, reading comprehension, and verbal problem-solving all require it to a significant degree. The following is an expanded list of methods that will help you increase your verbal working memory:

**Active listening** is the technique of actively focusing one's attention on the information that is being communicated, whether one is participating in a conversation or listening to a lecture. Pay attentive attention to the language, tone, and

main points that the speaker is making. You can improve your ability to remember information by avoiding distractions and making an effort to mentally summarise or repeat the information you need to remember.

**Reading out loud** can aid strengthen verbal working memory since it engages both the acoustic and verbal channels of processing information. While you are reading, make sure that the words and sentences are pronounced correctly. Your capacity for holding information in your working memory while also being able to manipulate it in real time will increase as you engage in this activity.

**Repeat and summarise:** Whenever you come across new material, such as directions, instructions, or reasons, you should read it aloud to yourself and then repeat it. Express in your individual thoughts the primary arguments or significant particulars. A better grasp and longer-lasting retention of the knowledge can be achieved through the practise of summarizing it.

**Engage in Discussions:** Taking part in conversations on a consistent basis will help strengthen your verbal working memory. Participate actively in discussions, listen intently, and reply meaningfully to other people's points of view. When you are having a conversation, you are required to process the information that is being provided to you, formulate responses, and maintain relevant information in the working memory.

**Story-telling:** it is a great skill to hone since it requires you to remember information and arrange it in a logical order. Practise telling stories. Try describing a narrative in one's own words or summing the plot of a book or movie that you've read or seen. By giving you practise in recalling and organising previously learned information, this exercise strengthens your verbal working memory.

Participate in word and **language-based games** such as crossword puzzles, word search puzzles, word association games, and other similar activities. These exercises put a strain on your verbal working memory by challenging you to recall, manipulate, and establish connections between a wide variety of words and linguistic components.

**Apply spaced repetition:** Spreading out your study and review sessions over an extended time period will assist in enhancing your verbal working memory and increase the amount of information you retain. Spread up your practise sessions over a longer period of time rather than trying to cram everything into one sitting. It is

important to go back over previously taught information regularly and review it so that the information is ingrained into your working memory.

**Develop your vocabulary:** Developing your vocabulary will give you with additional brain connections and associations, which will make it simpler for you to retain and manipulate information that is spoken. Acquire new vocabulary, become familiar with its meanings, and then train yourself to use the words in appropriate situations. Your verbal working memory will be put to the test with the use of a variety of novel language components in this exercise.

It's important to take pauses and **learn stress management** techniques because mental tiredness and stress might have an impact on working memory. During mentally taxing linguistic duties, it is important to allow your mind the opportunity to relax and recharge by taking frequent breaks. Because stress can decrease working memory performance, it is important to manage levels of stress with relaxation techniques, physical activity, or mindfulness practices.

Keep in mind that the only way to improve your verbal working memory is to consistently practice and put in the effort. Incorporate these tactics into your daily routine, concentrate on improving your verbal processing skills, and remember to be patient with your development as you work towards your goals. Your capacity to retain and efficiently manage the knowledge that other people verbally provide you with should, with practice and experience, grow with time.

## **6.2 Interventions & strategies to improve achievement motivation**

The term "achievement motive" refers to the drive that people have to excel in their endeavors, achieve their objectives, and be successful. The academic achievement of adolescents and their overall success are both significantly impacted by its presence. The following is a list of more in-depth methods to boost students' accomplishment motivation:

**Set realistic and challenging goals:** Encourage children to develop objectives that are both practical and demanding. Children should not only be encouraged to set specific and attainable objectives., but also those goals that involve effort and provide a sense of success when they are completed. Assisting them in breaking down larger goals into smaller, more achievable activities will enable them to experience success on a more gradual basis, which will help them create motivation.

**Provide feedback and recognition:** Provide students with feedback that is both encouraging and instructive, focusing on the areas in which they can develop. It is important to acknowledge and applaud all of their accomplishments, no matter how great or how tiny, in order to strengthen their sense of self-worth and their desire to do well.

**Encourage adolescents to have a growth mindset:** It is the belief that intelligence and abilities can be increased through hard work and practice. This mindset is essential to the success of this strategy. Instill in them a love of a good challenge, the mindset that viewing setbacks as learning opportunities, and the determination to keep going even when things don't go their way. By putting an emphasis on the significance of hard work and perseverance, this mentality makes it easier to establish a robust accomplishment motive.

**Nurture an Intrinsic Motivation:** One way to cultivate an intrinsic motivation in students is to relate their learning to their interests, passions, and the relevance it has to the real world. You can assist kids in locating significance and worth in their academic activities by putting an emphasis on the joy of learning rather than merely concentrating on the benefits or grades they receive from outside sources.

**Encourage autonomy and choice,** by giving students opportunities to make decisions and feel like they have some degree of influence over their educational experience. Provide them with a variety of tasks or assignments from which they can choose topics or approaches that are in line with their interests and the areas in which they excel. Students' feelings of ownership and motivation are increased when they are given more autonomy and choice.

**Encourage introspection and self-evaluation,** by saying things like, assist students in the development of their self-awareness by having them reflect on their progress, as well as their strengths and limitations. Instruct students to establish their own personal learning goals, monitor and assess their own progress, and evaluate the results of their efforts. Motivation can be increased when one engages in self-reflection since it fosters a sense of responsibility and personal development.

**Foster a supportive learning environment:** Create a culture in the classroom that rewards effort, collaboration, and support, and you will be fostering an environment

that is conducive to learning. Encourage relationships between students of the same age, as well as cooperative learning and cooperation, so that kids can learn from and be inspired by one another. Students are more likely to be motivated and encouraged to strive for excellence when they are in an environment that is pleasant and encouraging.

**Provide challenging and engaging tasks:** Tasks that are intellectually exciting and challenging should be provided to pupils, and they should be at a level that is appropriate for their skills. Make space for creative expression, problem-solving, and critical thinking by providing those possibilities. Students' interests and curiosities are piqued when they participate in engaging activities, which in turn fuels the students' motivation to achieve and thrive.

**Cultivate self-efficacy beliefs:** To assist student in developing a sense of self-efficacy, or the conviction that they are capable of attaining their objectives on their own, it is necessary to cultivate self-efficacy beliefs. Offer support in the form of scaffolding, increase the difficulty gradually, and create opportunities for students to gain mastery experiences. In order to boost both their self-assurance and their drive to succeed, you should acknowledge their achievements and push them to take on increasingly difficult challenges.

**Encourage a mindset and a language that is growth-oriented:** Make use of language that is upbeat and encouraging, as this will encourage growth, effort, and improvement. Drive home the point that one's skills can be improved via consistent practise, and that even one's failures may serve as instructive learning experiences. Establish a culture in the classroom that places a higher importance on progress and development than on competition and preconceived conceptions about students' levels of intelligence.

Enhancing achievement motivation is a process that occurs over time and is continual; this must be kept in mind. You may assist kids in developing a robust accomplishment motive that contributes to their academic success as well as their personal growth if you continuously put these tactics into practise and modify them to meet the specific requirements of individual students.



### **6.3 Interventions & strategies to enhance study habit and academic performance**

The adolescent years are a critical time for growth and development, and they are also a time when important academic shifts take place. Students will confront a variety of obstacles throughout this time, any one of which may have an effect on their study routines or academic success. For adolescents to attain their academic goals, excel in their assignments, and acquire learning abilities that can be used throughout their lives, developing productive study habits is absolutely necessary. The necessity of good study habits in adolescents and the impact those habits have on overall academic achievement is the focus of this essay.

**Time management:** It is one of the most influential factors in determining a student's academic performance. Good study habits are developed when adolescent students learn to prioritize their assignments, set aside enough time for studying, and refrain from procrastinating on their schoolwork. If students are able to successfully organize their schedules, they will be able to devote sufficient time to each topic, finish their assignments on time, and adequately prepare for their examinations.

**Learning through engagement and activity:** Active learning strategies are utilized by students who maintain productive study habits. They go beyond simple reading and memorization by adopting active learning tactics such as knowledge summarization, the creation of concept maps, and participation in conversations. These practises develop skills in comprehension, critical thinking, and problem-solving, which ultimately leads to better academic success.

**Taking notes and being organized:** Having the capacity to take notes that are clear and well organized. The academic demands that teenagers face can have a substantial influence on their study habits and performance. Adolescents are provided with the tools necessary to properly cope with stress when they are taught stress management strategies such as deep breathing exercises, mindfulness practises, physical activity, and appropriate sleep. They are able to keep attention, enhance learning, and do better academically if they learn how to manage their stress levels.

**Reviewing material on a consistent basis** and putting what you've learned into practise are two essential study habits for teens. Students' knowledge is strengthened and they are better able to retain information for the long term if they regularly review stuff they have already studied. Teenagers achieve topic mastery via consistent

practise, which also helps them to cement their learning, recognise gaps in their knowledge, and focus their attention on those areas.

**An atmosphere that is suitable for learning:** It is essential for the academic performance of teenagers to have an atmosphere that is suitable for learning. A study area that is uncluttered, calm, and well-organized makes it easier to concentrate on one's studies and reduces the number of potential distractions. In addition, cutting down on digital distractions by doing things like turning off cellphones or disabling notifications from social media might make it easier to concentrate and increase productivity.

**Stress Management:** The academic demands that teenagers face can have a substantial influence on their study habits and performance. Teenagers are provided with the tools necessary to properly cope with stress when they are taught stress management strategies such as deep breathing exercises, mindfulness practises, physical activity, and appropriate sleep. They are able to keep attention, enhance learning, and do better academically if they learn how to manage their stress levels.

**Seeking Out Support and Working Together:** It is essential for the academic performance of teenagers to encourage them to seek out support when it is required. They will be able to raise questions, seek explanation, and quickly resolve challenges if they establish open communication channels with their instructors, parents, and peers. Knowledge-sharing, critical thinking, and the ability to solve problems are all qualities that benefit from collaborative learning environments, which in turn contribute to increased academic success.

The formation of productive study habits is absolutely necessary for teenage students who wish to achieve academic success. Teenagers have the ability to improve their study habits and their academic performance by adopting tactics such as effective time management, active learning, regular review, and stress management. It is crucial for educators, parents, and students to recognize the relevance of these study habits and work cooperatively to establish a supportive learning environment that encourages growth, accomplishment, and a passion for learning that lasts a lifetime among teenagers.

#### **6.4 Suggestions for further research**

Reviewing the above research studies it is observed that no study is seen in which impact of working memory and gender on achievement motivation, academic performance and study habits altogether. The following research gaps are identified:

- a) Exclusion of Hindi speaking and rural students
- b) Exclusion of government schools
- c) Exclusion of primary age group of students
- d) Exclusion of Pan-India coverage
- e) Exclusion of children with special needs.
- f) No Mental disorder as per DSM-5
- g) No physical impairment that could impede the evaluation's execution.

Any research can serve its purpose if it can open up areas for future research. The key is to make sure that it not only contributes to the society in its current form with all the findings, but it also lays down the foundation for improvement which can further enhance overall value of the research.

While conducting this research there were many instances where it was felt that, this could be an area for future research. Not only, can this study be extended to cover more cities, it can also be extended to include rural schools as well to start with. Further, one can conduct longitudinal investigations that follow adolescents over an extended period of time. This would allow researchers to examine the longitudinal association among working memory and academic performance, achievement motivation, and study habits. Longitudinal research offers a deeper comprehension of the developmental trajectory and possible causal relationships.

Since this research focused on verbal working memory and its impact, the future studies can either look to find the impact of other aspects of working memory or take different aspects of working memory together to investigate their influence on study habits, academic performance and related aspects.

Future studies can implement experimental designs to investigate the association among working memory and academic outcomes. For instance, researchers can conduct interventions that seek to enhance working memory through targeted training programmes and then evaluate the effects on academic performance, motivation, and study habits.

Another aspect that can be explored is related to working memory. It should be evaluated using a combination of objective and subjective measures. The researchers can incorporate both laboratory-based and ecologically valid objectives that reflect actual academic requirements. We can consider using self-report measures to collect data on students' perceived working memory abilities, academic motivation, and study routines.

Moreover, if the future research can include diverse samples of adolescents from a variety of backgrounds, socioeconomic conditions, and educational contexts as aforementioned then it can contribute more to the education ecosystem. This would aid in the identification of potential individual differences and contextual factors influencing the relationship between working memory and academic outcomes. It is crucial to ensure that research findings can be applied to a diverse population of adolescents.

If, in future studies, we can account for potential confounding variables that may influence the relationship between working memory or its different components, study habits, achievement motivation and academic performance, such as intelligence, attention, and socioemotional variables, then by controlling these variables, researchers can more precisely isolate the contribution of working memory to academic outcomes and motivational factors. For instance, variables such as motivation, attention, executive functioning, and socioeconomic factors may moderate or mediate these relationships.

The success of this or any deep dive in this topic can be increased by transforming the research findings into interventions that can be implemented in educational settings. Not only the endeavor is to create interventions that target adolescents' working memory, academic motivation, and study habits but to enable the educational institutes to implement them effectively, so that the next studies can evaluate the efficacy of these interventions in enhancing academic performance and achievement motivation of the students.

Another effective way to promote and further improve this research is to increase and promote collaboration between researchers from various fields, including psychology, neuroscience, education, and cognitive science. Collaboration can result in a more thorough comprehension of the topic. Encouraging the replication studies will

validate findings of the current research and will also guarantee the dependability of research results.

With the non-stop advancement in technology, if we can examine the use of all upcoming technology in evaluating and enhancing working memory, academic motivation, and study practices then we will be able to do achieve the true objective with which we had set out for while starting this research. Developing digital tools and applications that can objectively measure working memory, provide individualised feedback, and provide strategies for improving study practices is another way to do one up to this study. This integration can facilitate the collection of data and the delivery of interventions.

The future work can utilize qualitative research methods, such as interviews or focus groups, to obtain a more in-depth understanding of adolescents' experiences, perceptions, and strategies in relation to working memory, academic motivation, and study habits. In addition to complementing quantitative findings, qualitative data can provide abundant insights.

A very important aspect of any learning in every field is how can we make use of it for the benefit of not only the immediate community in which it was conducted, but also how can the results can be extended to the whole society – without geographical borders. Conducting cross-cultural studies to assess the generalizability of research results across diverse cultural contexts can be the step in this direction. By doing this we can examine the influence of cultural factors, educational practises, and societal expectations on the relationship between working memory, academic performance, achievement motivation, and study habits.

Researchers can improve the quality and applicability of their studies on working memory and its effects on adolescents' academic performance, achievement motivation, and study routines by implementing the aforementioned recommendations. In turn, this can contribute to the development of interventions and strategies founded on evidence to support student learning and success.

Also, the further research can include Hindi speaking as well as rural students so that it will give a complete picture of how all these factors play across the national level. This will mean that the study should include government schools in the sample selection.

Another dimension which can be added to the study is the inclusion of primary age group of students for a similar study so that a comprehensive view about the impact of working memory on the different factors can be understood and related intervention across different age groups can be identified and implemented.

While there has been much talk of inclusion in the education ecosystem, we still see that there are few studies which cover. In fact the initial idea of this study was to study the impact of verbal working memory on students with special needs, but because of practical difficulties regarding sample collection the special needs students were excluded in this study. However, an organisation with enough sample size and resources can enhance the overall value of this research topic by including the students with special needs in such a study. This will definitely be a much needed research and will also help us to be more inclusive in the real sense.

Also, if we compare the research landscape across India and the rest of the world, it is found that in India, research investigates effects of working memory on learning outcomes and proposes active learning interventions within the context of diverse educational practises. In the meantime, worldwide research investigates the relationship between study practises and working memory, with an emphasis on the role of neuroscience in education. It is essential to overcome obstacles such as cultural adaptation and implementation gaps to translate research into effective classroom practises.

For this first, we need to take into consideration cultural diversity in educational practises and societal norms is emphasised to ensure that interventions are suitable for particular contexts. Second, a divide between research insights and classroom application should be identified, necessitating collaborative efforts between researchers, educators, and policymakers to effectively translate theory into practise. Lastly, the recognition of individual variations in the working memory capacities of students highlights the significance of adapting instructional strategies while maintaining academic standards.

Researchers, educators, and policymakers must work together to bridge the gap between theory and practise in order to enhance student learning outcomes by incorporating research-based strategies into educational systems.

### 6.5 Practical implications of the research

While there are more layers to this current study and which as mentioned above can lead to further researches in the times to come, but the current study and the outcomes will not only help the students but the larger ecosystem involving teachers as well as parents and the society at large. The results of this study can be applied to the real-life situations which can enhance the overall learning experience.

Here are some ways where results of research can help:

1. **Educational Interventions:** Educators, using the findings of the research as a foundation, can construct educational interventions and instructional methodologies that are centered on the goal of increasing students' capacities of working memory. This may comprise training programmes, strategies that enhance memory, or particular teaching approaches that assist pupils' better control and utilise the resources of their working memory.
2. **Curriculum design:** The findings of this research can help the developers of curriculum to appreciate the cognitive burden that is imposed on students' working memory while designing the curriculum. Working memory can get overwhelmed when complex activities or an excessive amount of knowledge are performed, which can result in decreased motivation and performance. Educators can boost students' success motivation and academic performance by organising the curriculum in a way that reduces the cognitive load on pupils and facilitates the processes that take place in their working memory.
3. **Individualized Support:** It is helpful for educators to identify kids who have a lower working memory capacity so that they may give tailored support to such individuals. Teachers will be able to better personalize their instruction for these kids if they are aware of the unique obstacles they confront and are able to apply tactics such as scaffolding, repetition, and breaking the assignments into more manageable chunks. The assistance of this personalized support can help students to overcome their working memory impairments and increase their motivation and academic performance.
4. **Methods of Evaluation:** The use of standardised exams and other types of evaluations frequently places a major strain on the working memory. Students will be able to exhibit their genuine talents if alternative assessment techniques are developed as a result of this research by looking into the connection between

working memory and academic achievement. These methods will impose less burden on students' working memory than traditional testing procedures. This can be achieved by implementing more project-based assessments providing more time for activities that are more complicated.

5. **Study Skills training:** The development of efficient study skills is an essential component in maximising the use of one's working memory resources. The findings of this research may be utilised to construct study skills training programmes that teach students how to efficiently manage their working memory, organise material, employ mnemonic methods, engage in active learning tactics, and so on. Students' achievement motivation and academic performance can be improved if they are given the opportunity to develop these abilities.
6. **Support from Parents and Teachers:** Sharing the findings of this study with parents and teachers will assist these individuals in better comprehending the significance of working memory in relation to the motivation and performance of students. This understanding may enable parents and teachers to offer the right support and establish a conducive atmosphere that encourages the development and utilisation of working memory abilities. Working memory refers to the part of a person's memory that is actively used for processing information. For instance, they might suggest taking breaks while the student is studying, give assistance in the form of organisational tools, and provide compliments and positive reinforcement for the student's efforts rather than merely their grades.

In broad terms, research on working memory and its influence on achievement motivation and academic performance may guide a variety of practical interventions in educational contexts. These interventions can empower students, parents, and educators to optimise learning experiences and results. Any incremental improvement in the ways the knowledge is imparted and the manner which it is absorbed by the learning community and more importantly the students, which are the future of any nation, bodes well for the future of the country. It was the underlying reason for this research and any positive contribution which these suggestions can make, will be a sign that this research has served its true purpose.



# APPENDIX- I TO VI