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Factors Affecting the Study Habits of Senior High School Students of the Science, Technology, Engineering and Mathematics (STEM) Curriculum

Dr. Lina Sobrepeña - Calucag
Research Director, AMA International University Bahrain

Abstract: ***A descriptive-comparative research design was used in determining the factors affecting the study habits of senior high school students of the Science, technology, Engineering and Mathematics (STEM) curriculum. The respondents of the study were 300 senior high school students under the STEM curriculum. The Slovin's formula was used to determine the ideal number of respondents with 0.05 level of significance. A parametric statistical test particularly the t-test was used to test the difference on the study habits of the STEM students particularly time management, study environment and academic skills when grouped according to sex and type of school graduated from. Results showed that, the test of significance conducted and revealed that the male students' study habits on test preparation, note taking skills and reading skills are better than the study habits of the female students on the aforementioned variables. Further, the study habits specifically on time management, study environment, test preparation, note taking skills and writing skills of the STEM students graduated from the public schools are better than the study habits of the students graduated from the private schools.***
Keywords: study habits, STEM, STEM curriculum, senior high school

I. INTRODUCTION

The economy, our general well-being - it's all backed by science, technology, engineering, and math (STEM); hence, STEM is important because our world depends on it [1]. STEM education, as one of the most striking educational movements in the 21st century [2] [3] [4] [5]. It creates critical thinkers, increases science literacy, and enables the next generation of innovators.

The center of any educative process is the learner. Without the learner, there would be no need for teaching. The system of education or schooling is a macro-view of the learning process [6] [17] [18]. Senior High School is a program that covers twelve years of basic education that aims to provide lifelong learners, develop well-integrated students and prepare graduates for tertiary education.

There are some factors which affects a student's implementation of study habits on a contextual manner. Study habits are the practices performed to maximize student's productivity, efficiency and retention in preparation for a particular evaluation. It improves the prediction of academic performances more than any other non-cognitive individual difference variables examined to date and should be regarded as the third pillar of academic success.

Study habits are mainly external factors that facilitate the study process such as sound study routines that include how often a student engage in studying sessions, review the material, self-evaluate, explaining the material, and studying in a conducive environment [7]. Study habits significantly contributes in the development of knowledge, hence, there is a need, to guide the students about meaningful learning to be able to memorize things in a better way. Students improve their performance because they can learn most of the concepts clearly through proper study habits. Study habits refer to learning which leads to the achievement of a learner's goal, through a prescribed pattern of steady behaviour.

A student must know learning method and study habits, which help him to achieve the goals of education. Learning through good study habits is the key process in human behaviour. Educators always show concern in the learner's education because learning in good study habits influences individual's aptitude. One of the most common challenges to success of students in all ramifications is a lack of effective study habit.

The main objective of the study is to determine the factors affecting the study habits of the STEM students in terms of: environment, time management; and academic skills. The results will be the basis for an intervention programs that will address the problems and thereby fortify the enactment of the Senior High School-STEM curriculum shall be improved and implemented.

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II. METHODOLOGY

A descriptive-comparative research design was used in determining the factors affecting the study habits of senior high school students of the Science, Technology, Engineering and Mathematics (STEM) curriculum. Also, it is suited in this study for it provides descriptive information on different study habits of STEM students. The respondents of the study were 300 senior high school students under the STEM curriculum. The Slovin's formula was used to determine the ideal number of respondents with 0.05 level of significance. An adopted survey sheet was used to acquire all the necessary data used in the study. The questionnaire was divided into 2 parts. The first part was the respondent's profiles which include sex and type of school graduated from. The last part was the important questions about time management, study environment, test taking or preparation, note taking skills, reading skills, writing skills and math skills which may affect their study habits. The instrument used aims to determine the study habits of the students and the factors affecting them in terms of environment, time management and academic skills.

The respondents were informed about the objective of completing the questionnaire, the confidentiality of their responses and that the data would only be utilized for the purpose of this study. Students were given a short orientation on how to respond to the items of the research instruments. Students were allowed to complete the questionnaire with unlimited time. The study made used of frequency count, percentage, mean, standard deviation and Independent Samples t-test to determine the significant differences of the study habits of students in terms of environment, time management, test preparation and academic skills, using the Statistical package for the social sciences (SPSS).The survey sheet is standardized in which contents of the survey sheets were empirically selected and checked, norms were established and methods of administering in interpreting the data is followed.

III. RESULTS AND DISCUSSION

A series of comparisons were made to establish factors affecting the study habits of Senior High School Students of the Science, Technology, Engineering and Mathematics (STEM) Curriculum.

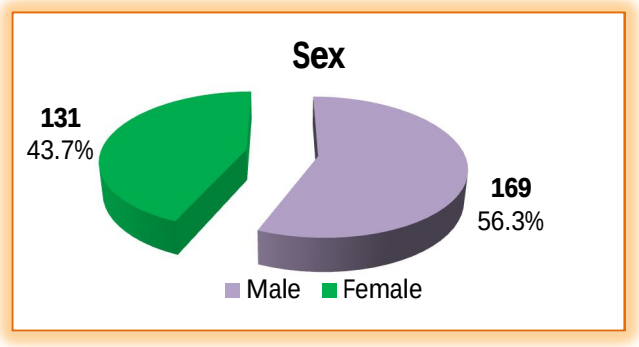

Fig. 1. Demographic profile of the respondents in terms of sex

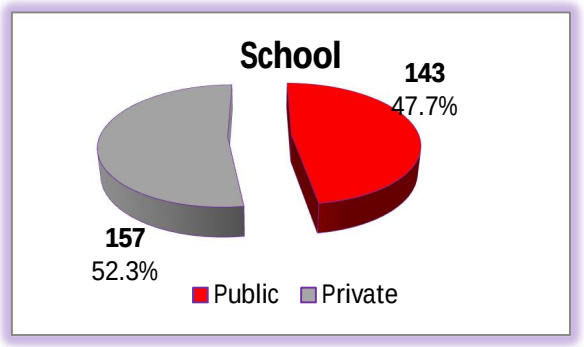

Fig. 2. Demographic profile of the respondents in terms of school graduated from

The above graphs show the demographic profile of the 300 STEM students as respondents of the study. One hundred sixty-nine or 56.3% are male respondents and 131 or 43.7% are female respondents. Moreover, 157 or 52.3% graduated from public high school, while 143 or 47.7% graduated from private high school.

IV. FACTORS AFFECTING THE STUDY HABITS OF THE STEM STUDENTS

Time management. Time management is important for students to do the study with focus. Student's success in studies depends much on managing time efficiently. The habits and morals they acquire during schools time and home will stick with them throughout the future. It shapes the student's mind into the direction of discipline and sense of duty. Time management is a skill that enables students to use their time productively and efficiently. For full-time students, effective time management makes a huge contribution to their success [8].

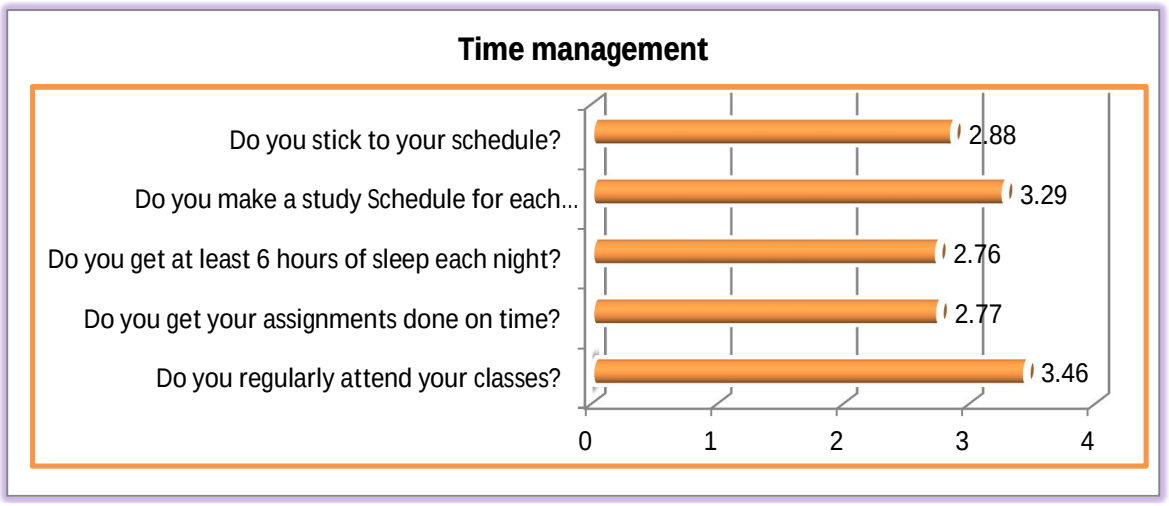

Fig. 3. Mean scores of the respondents on the time management as a factor affecting study habits

Most of the students claimed that, *regularly attending classes and preparing study schedule* are always a habit of the STEM students. While, *preparing assignments on time with 6 hours sleep at night* and *stick on the given schedule* are sometimes habits to the students.

Study environment. Many students work hard to acquire good study skills, but not many realize that having the right place to study is just as important. The study environment can be a big factor in how successfully a student will learn and retain information and be able to apply it in assessments and on the job [11].

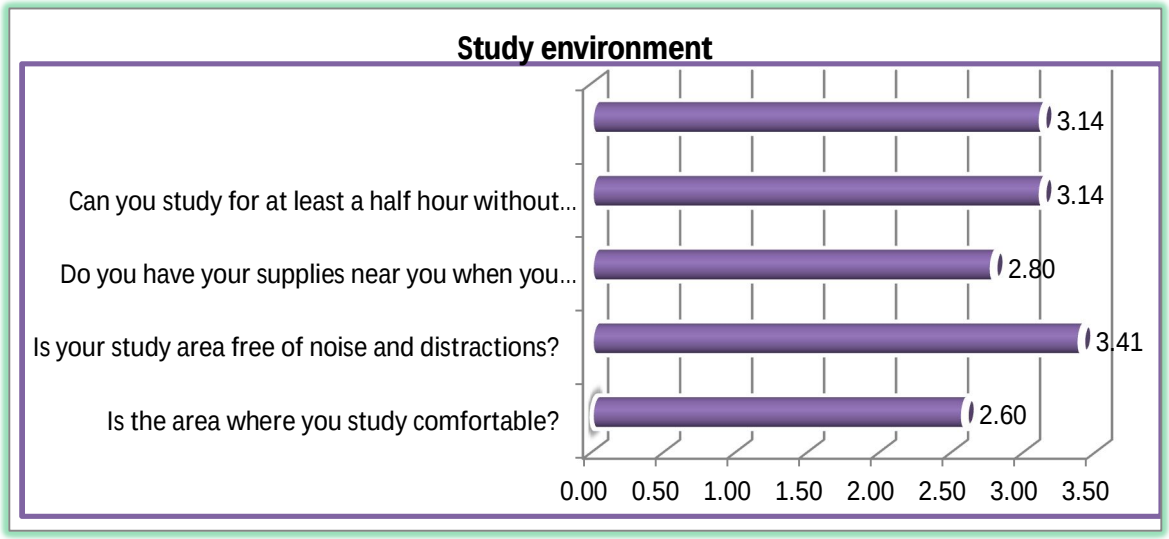

Fig. 4. Mean scores of the respondents on the study environment as a factor affecting study habits

Majority of the STEM students affirmed that, studying *for at least a half hour without getting up, walking about, taking snack or TV or Phone breaks* and ***the*** *study area is free of noise* are always a habit to achieve a desirable result. The result of the study coincides with the study of [12], according to previous studies, good study habits include studying in a quiet place, studying daily, turning off devices that interfere with study (such as TV and mobile phones), taking notes of important content, having regular rests and breaks. Moreover, *the students preferred to be alone when studying*, this is affirmed by the study of [16] also states that students who independently study has good study habits. On the other hand, the students claimed that, *the area of study should be comfortable and school supplies around the study area.*

Test preparation. Preparing for exams is the key to success [13] like sport; exams require knowledge, skills, practice and a positive attitude. Having the right attitude towards the study is very important; the goal is to perform at the peak on exam day. Being well prepared boosts one's confidence.

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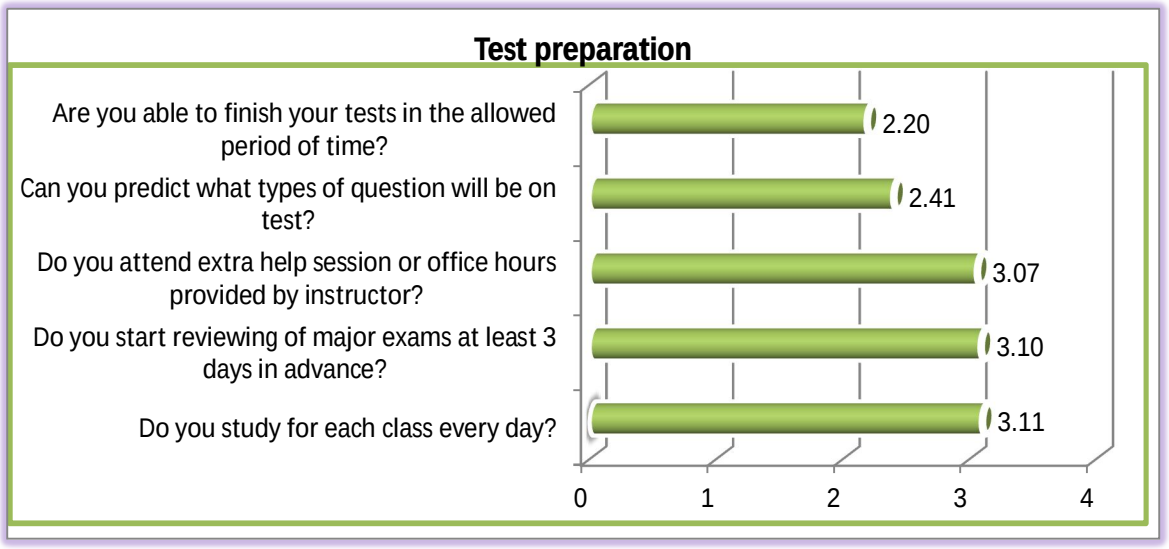

Fig. 5. Mean scores of the respondents on the test preparation as a factor affecting study habits

Greater part of the STEM students claimed that, in taking test or test preparation, the students are always *start reviewing of major exams at least 3 days in advance* and *study for each class every day*. This is in accordance with [14] cited eight steps to effective study set a realistic goal for the exam and determine a daily amount of time to study each course.Moreover, the students can *predict the type of question will be on the test* and sometimes *attending extra help session or office hours provided by the instructor*. Furthermore, not all students are able to finish the tests in allowed period of time.

Academic skills. The academic skills that were included in the study are mathematics skills, writing, skills, reading skills and note taking skills. These skills were tested to determine and utilize the comparison among the study habits of STEM students in terms of skills.

Mathematics skills. The mathematics skills is the foundation of STEM and must be applied in pursuit of solutions. It is used to solve problems connects to and extend the coursework, as well as highlight connections between ideas and subject areas [15]. STEM students recognized the vital importance of mathematics skills in the STEM curriculum. Hence, the students considered the following study habits: *good command of the pre-requisite skills for math, always do the homework assignment* and *work the problem before looking at the solution and participate in class and ask question when you the concept is not understood*; that enhances the mathematics skills and academic performances.

Writing skills. Writing skills across the curriculum can offer students deeper analytical knowledge of subject areas such as math and science as well as an improved ability to process and write about nonfiction and scientific texts[8]. Majority of the STEM students affirmed that, *they are comfortable with command English grammar, punctuation and spelling*. Moreover, *communicate effectively in writing* is a significant skill for STEM students.

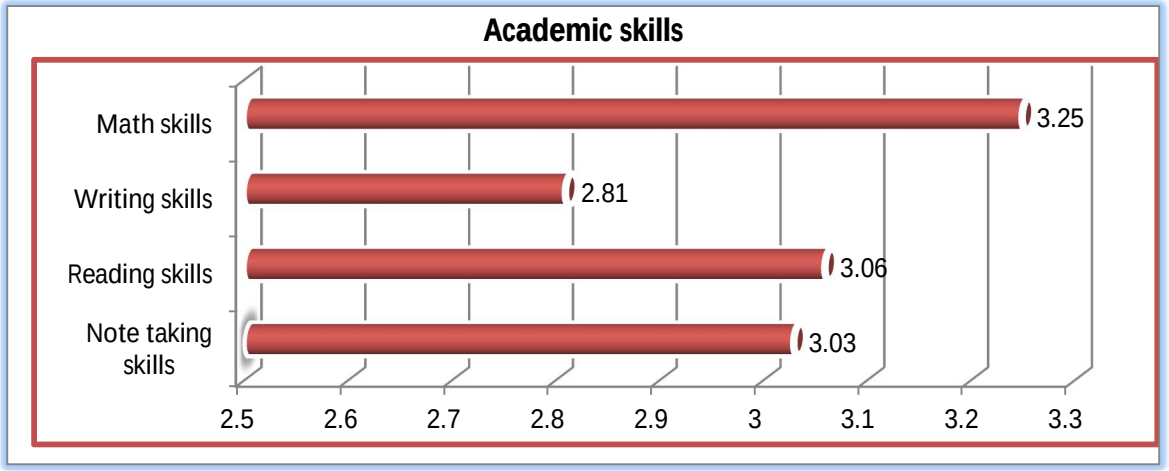

Fig. 6. Mean scores of the respondents on the academic skills as a factor affecting study habits

Reading Skills. Most people skim read, they don't take the time to actually read articles and understand what they are reading. Reading at a University level requires the student to understand the context of what they have read, and how what they have read fits with the topic they are reading about. Information such as, where the material was written, when the material was written, who wrote the material, all impacts how relevant the material is to the topic that is being studied [8]. Most of the STEM students affirmed that, *reading topic materials before and after the lecture proper is important*. Further, STEM students *always browse the headings, pictures, chapter questions and summarize it before reading the chapter*.

Note Taking Skills. Most people who mark essays are suitably impressed when a student uses high quality, relevant academic research materials for essays [8]. Effective note taking is an essential skill for the students to learn before going on to further education. Using short videos, students take notes while they watch. Further extension tasks can then include having the groups summarize their notes into a tweet, or, if it's a higher-level group, have them paraphrase their notes into their own words [10]. Majority of the STEM students claimed that, *taking notes in class keep up with the instructor, and understand the concepts at the same time* is necessary to achieve a note taking skills. Moreover, *reviewing the notes after the class, preferably after the class period* is a significant factor for note taking skills to achieve maximum academic performance.

Table 1. Difference on the study habits of the STEM students when grouped according to sex

Study Habits	Sex	N	Mean Difference	t-test for Equality of Means	df	Sig. (2-tailed)	Statistical description
Time management	male	169	.0475	.905	298	.366	Statistically not significant
	female	131					
Study environment	male	169	-.0707	-1.235	298	.218	Statistically not significant
	female	131					
Test Preparation	male	169	-.1366	-3.464	298	.001*	Statistically significant
	female	131					
Note taking skills	male	169	-.1424	-2.934	298	.004*	Statistically significant
	female	131					
Reading skills	male	169	-.4928	-12.360	298	.000*	Statistically significant
	female	131					
Writing Skills	male	169	.1191	1.868	298	.063	Statistically not significant
	female	131					
Math skills	male	169	-.0330	-.896	298	.371	Statistically not significant
	female	131					

* Mean Difference is significant at 0.05 level of significance.

A parametric statistical test particularly the t-test was used to test the difference on the study habits of the STEM students when grouped according to sex. The table shows the test of significance conducted and compared the mean scores of the male and female students with their study habits. The test of significance conducted and which compared the mean scores of the students in their study habits, as shown in the above table, yielded p-values which was greater than $\alpha = .05$ (two tailed) in the following study habits: time management, study environment, writing skills and mathematics skills. It clearly shows that there was no significant difference between mean scores of male students with the females students regarding their study habits. However, in the same table, the test of significance conducted and which compared the mean scores of the scores of the male and female students with their study habits, yielded p-values which was smaller than $\alpha = .05$ (two tailed) in the following study habits: test preparation, note taking skills and reading skills. Hence the null hypothesis which states that there is no significant difference on the study habits of the STEM students when grouped according to male and female is rejected, specifically on test preparation, note taking skills and reading skills. Further, the test of significance conducted and revealed that the male students' study habits on test preparation, note taking skills and reading skills are better than the study habits of the female students on the aforementioned variables.

Table 2. Difference on the study habits of the STEM students when grouped according to the type of school graduated from

Study Habits	Type of school graduated from	N	Mean Difference	t-test for Equality of Means	df	Sig. (2-tailed)	Statistical description
Time management	public	143	-.5970	-15.284	298	**.000***	Statistically significant
	private	157					
Study environment	public	143	-.5744	-12.413	298	**.000***	Statistically significant
	private	157					
Test Preparation	public	143	-.2466	-6.611	298	**.000***	Statistically significant
	private	157					
Note taking skills	public	143	-.3449	-7.732	298	**.000***	Statistically significant
	private	157					
Reading skills	public	143	.0684	1.410	298	.160	Statistically not significant
	private	157					
Writing Skills	public	143	-.6502	-12.672	298	**.000***	Statistically significant
	private	157					
Math skills	public	143	-.0211	-.575	298	.566	Statistically not significant
	private	157					

* Mean Difference is significant at 0.05 level of significance.

A parametric statistical test particularly the t-test was used to test the difference on the study habits of the STEM students when grouped according to the type of school graduated from. The table shows the test of significance conducted and compared the mean scores of the students graduated from public or private with their study habits. The test of significance conducted and which compared the mean scores of the students in their study habits, as shown in the above table, yielded p-values which was greater than $\alpha = .05$ (two tailed) in the following study habits: reading skills and mathematics skills. It clearly shows that there was no significant difference between mean scores of students graduated from public schools with the students graduated from the private schools regarding their study habits. However, in the same table, the test of significance conducted and which compared the mean scores of the scores of the graduated from public or private with their study habits, yielded p-values which was smaller than $\alpha = .05$ (two tailed) in the following study habits: time management, study environment, test preparation, note taking skills and writing skills. Hence the null hypothesis which states that there is no significant difference on the study habits of the STEM students when grouped according to the type of school graduated from is rejected, specifically on time management, study environment, test preparation, note taking skills and writing skills. The test of significance conducted and revealed that the study habits specifically on time management, study environment, test preparation, note taking skills and writing skills of the students graduated from the public schools are better than the study habits of the students graduated from the private schools.

V. CONCLUSIONS AND RECOMMENDATIONS

Most of the students claimed that the following factors affects the study habits of the students under the STEM curriculum: regularly attending classes, preparing study schedule, preparing assignments on time with 6 hours sleep at night, stick on the given schedule, studying for at least a half hour without getting up, walking, taking snack or TV or Phone breaks,study area is free of noise, good command of the pre-requisite skills for math, always do the homework assignment, work the problem before looking at the solution, participate in class and ask question when the concept is not understood, comfortable with command English grammar, punctuation and spelling. Moreover, communicate effectively in writing is a significant skill for STEM students and reading topic materials before and after the lecture proper is important. Further, taking notes in class keep up with the instructor, and understand the concepts at the same time is necessary to achieve a note taking skills. Reviewing the notes after the class, preferably after the class period is a significant factor for note taking skills to achieve maximum academic performance.Results showed that, the test of significance conducted and revealed that the male students' study habits on test preparation, note taking skills and reading skills are better than the study habits of the female students on the aforementioned variables. Further, the study habits specifically on time management, study environment, test preparation, note taking skills and writing skills of the STEM students graduated from the public schools are better than the study habits of the students graduated from the private schools. Based from the conclusion of the study, it is recommended to the school administrators to make an intervention programs for some factors affecting the study habits of the senior high school students of the STEM curriculum which are rated with lesser importance.

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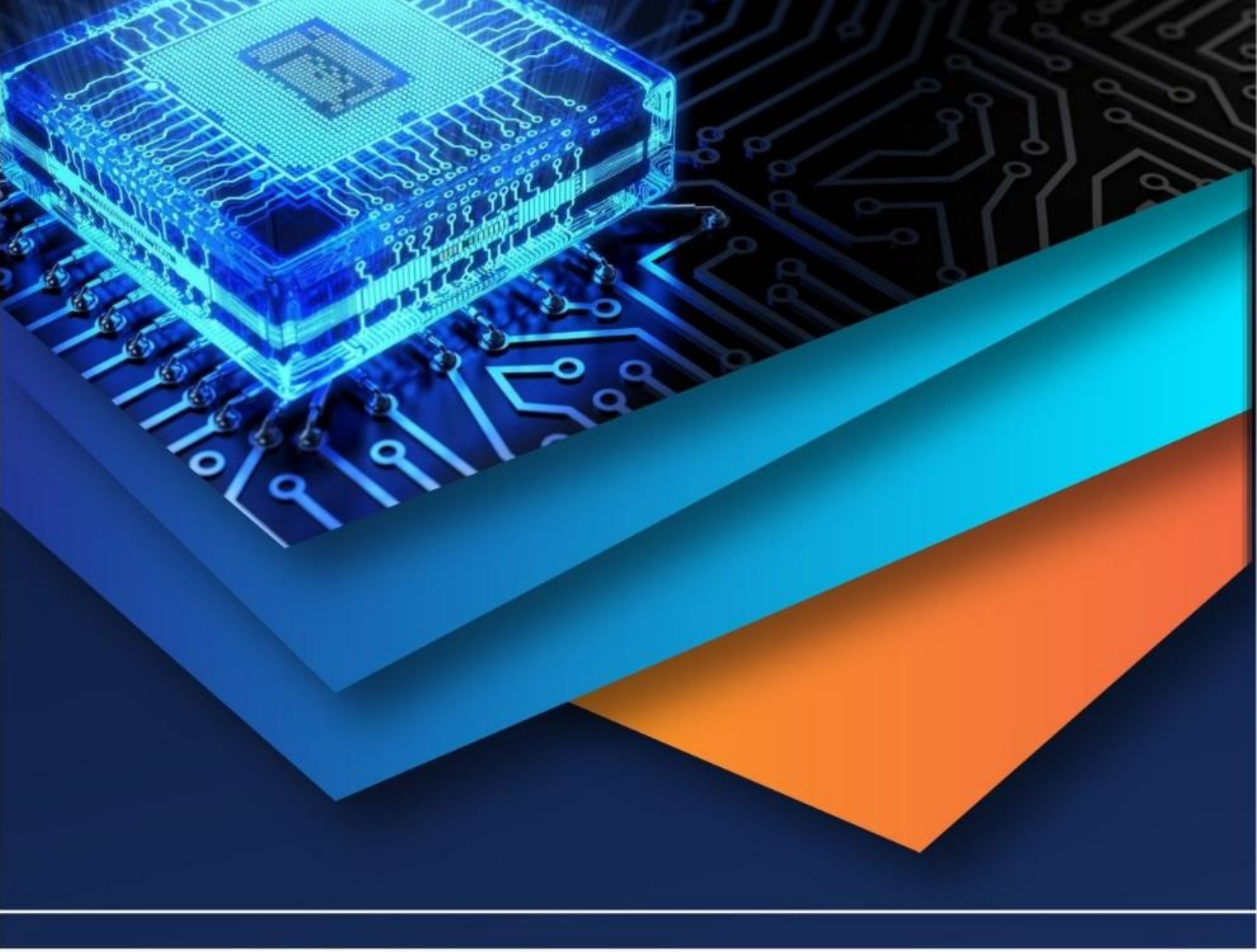

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