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Impact of Technologies and Co-Curricular Activities on Students' Academic Achievement at the Undergraduate Level

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This study examined the impact of technologies and co-curricular activities on students' academic achievement at the under graduate level. The data collection includes 200 enrolled college and university undergraduate students, male and female, class of 2018 who participated in this research study in Karachi, Pakistan. Universities can measure student success through the grade point average (GPA) attained in their exams, whereas colleges measure students' performance through the highest percentage, which determines student academic success. While evidence exists that extracurricular activities benefit student achievement, the relationship between such participation and student learning, as measured by GPA, has not been quantified. This study sought to understand how technologies and co-curricular activities affect students' academic performance. The findings depict a significant positive relationship between co-curricular activities and students' academic performances. Furthermore, the results showed a weak impact of technologies on students' academic performances. Colleges and universities may contribute to increased student learning through co-curricular activities. To improve student learning, universities should introduce, understand, and implement technologies and co-curricular activities to enhance their students' knowledge, skills, and abilities.

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1. Introduction

Academic performance and leisure time activities such as family time, music, and athletics are affected by in-class education. The Department of Education found that co-curricular activity participants have a threefold higher GPA than non-participants (Stephens & Schaben, 2002). Simon (2001) found that parenting, volunteering, and home-learning improve student grades regardless of background or academic performance. Multiple studies show that diverse activities affect student performance. BUGS at the University of North Texas highlights that the home environment affects academic success for young girls and their parents (2003, para. 2). Student achievement appears to be linked to extracurricular activity engagement. Technology's impact on students' academic achievement is debated. Researchers disagree with the impact of this link (Shin, 2004).

The impact of music and sports on academic performance is debated. Principals at middle schools want to know how interscholastic sports affect academic performance (Stephens & Schaben, 2002; Akram et al., 2024). The effects of these activities on grades are unclear. Description studies observe and analyze behavioral patterns in nature. They describe behavior, investigate an event, and test theories (Ahmad et al., 2024). This study examined how students' activities and technology affect undergraduate academic performance. Technology's perceived cost and lack of facts on its influence on student learning have eroded co-curricular activity faith (Cuban, 2001; Akram et al., 2024). Since the 1960s, when computer technology modified Skinner's teaching machines, education technology has been widely debated. Technology's impact on society, the effects of internet access for information and learning, and the effects of technology in extracurricular activities on young people's social, emotional, and physical development are currently being discussed.

Technology's impact on graduate and undergraduate students' academic performance must be examined. This also concludes that every student needs educational technology. To succeed academically, men and women must comprehend technology and participate in co-curricular activities. Students' academic performance in several curricular areas is compared to their schools' technology availability and quality to examine technology's impact on teaching and learning. Co-curricular technologies in the US are not well-connected. The researcher studied the educational effectiveness of multimedia programs, including images, sound, music, texts, and animations. What makes technology stand out? Late 20th- and early 21st-century research suggests that co-curricular activities have no negative impact on students' academic and social achievements (Marsh & Kleitman, 2002; Ali et al., 2023). Extracurricular activities should receive major funding from colleges. Activity programs typically receive 1-3% of high school budgets.

Many students have superior technological abilities and participate in extracurriculars. Thus, understanding how technology and co-curriculars affect academic performance is vital. By teaching students how to use their leisure time, this study hopes to improve academic achievement. Administrators must allocate resources and staff for these tasks. Technology and co-curricular data could inform these decisions. Due to lower enrollment and income, budgets are stretched to fund essentials. Many students do sports, but some focus on academics. Are

these activities beneficial to these students? Does debate team membership improve academic performance? Does yearbook or newspaper committee membership affect English grades? Can student club members improve their social studies? This will be studied by scientists.

Can technology and co-curriculars improve kids' learning? This essay examines how technology and co-curriculars affect student performance. Previous research in this chapter focused on college students. This survey includes 200 2018 college and university students, undergraduates. The participants include male and female. Universities evaluate students by their highest test GPA, while colleges use divisions. Co-curriculars boost student achievement, but their effect on GPA is unclear. The study examined how technology and co-curriculars affect academic performance.

1.1 Objectives of the Study

1. To examine the relationship between Technologies and Students' Academic Performance.
2. To examine the relationship between Co-curricular Activities and Students' Academic Performance.
3. To examine the impact of Technologies and Co-curricular Activities on Students' Academic Performance.

2. Literature Review

E-learning uses web-based homework (WBH) software to deliver content or assist students in practicing and learning. E-learning has primarily focused on the function of technology. Hamid (2001) emphasizes that students learn and adapt the technology to their needs. He mentioned that "in our eagerness to embrace technology, we sometimes forget the fundamentals" and adopt technology without knowing if it will help pupils learn. He recommends rethinking e-learning to avoid gaining outmoded technology skills at the price of critical thinking. Website assignment and testing software are used by the learners (Akram, Sewani, & Ahmad, 2024). Online textbook publishers' software allows millions of university students to do assignments. Technology is used because homework is practiced, and faster feedback helps kids learn (Pascarella & Terenzini, 2005). This delivery and assessment mechanism is evolving, making efficacy research timely and important.

Online WBH software helps students finish homework and get feedback quickly. Businesses' widespread IT use and IT-induced tech changes have changed the classroom (Khoso et al., 2023). Academics use IT to improve university learning, unlike many companies. Professors must shift classes owing to grading when funds tighten and class sizes rise. Instead of eliminating homework, some teachers employ WBH software to provide rapid feedback and practice. Instant grade recording helps teachers. WBH has cons. Some publisher WBH sites don't clarify student errors. It could be a rounding error, decimal, or transposed number, but the student is unaware. Newer apps may link to textbooks or hint.

Another problem is students cheating to finish tasks. Some WBH versions give advice after the first, second, or third try, helping students type anything rapidly. Formula cues let students avoid opening books. Problem: right-or-wrong grading emphasizes response over

procedure. Balance sheets are created by WBH software from lists. The student has a form and few account options. WBH can take longer than schoolwork. Bonham et al. (2001) found that WBH students did homework 30–60 minutes longer per week than paper-based students. Internet homework only credits accurate responses, unlike traditional homework.

Many students consider program and course material as extra effort. Others lacked technical support for printing, software, and websites. Before WBH became popular, Eskew and Faley (1988) investigated accounting students' performance and concluded that past academic achievement was the best predictor of future success, as grades reflect future performance. In academia, GPA predicts student performance. Negative emotions hurt student performance. Learning goals are linked with student performance. High goals neutralize negative emotions such as self-doubt, etc., whereas low goals negatively impact student performance. WBH software Negative emotions can hinder student performance, especially low-learning-goal students. Cron studied anger, anxiety, disappointment, embarrassment, and discomfort. The study investigated student frustration and performance. This study did not address co-curricular technology use. Many studies consider tech use as a leisure activity. Less technology and more co-curriculars and structured activities boost exam scores (Marsh & Kleitman, 2002; Haider et al., 2024).

Technology impairs student performance, studies reveal. In 1999, Bar-on reported 4000 tech-use studies. According to an education article, most studies have found no link between technology use and academic performance. Ali et al. (2023) found a weak but significant connection. Technology has three detrimental effects on student grades. The temporal displacement hypothesis states that technology distracts viewers and pupils, affecting grades (Hafeez et al., 2021). According to the mental-effect theory, technology causes mental laziness. Technology takes less mental focus than reading and writing, lowering intellectual effort. The third and final hypothesis, the arousal hypothesis, states that technology increases spontaneous behavior and decreases academic accomplishment since its frequent movements discourage sustained effort. Technology distracts kids from schoolwork by causing apparent intellectual processing.

Technology use affects student performance. Researchers found that technology use has no negative influence on student performance until youngsters use it 10 or more hours a week and a substantial negative effect when they use it 30 hours. According to Ali et al. (2022), technology improves studies to a certain point before hindering them.

Discussing technology and student TV. Educational shows and documentaries improve pupils' grades. However, action films, cartoons, and music would harm their minds and grades (Ahmad et al., 2024). Technology use hurts academic performance in most research, but outliers exist. Youth have Internet access on modern laptops and phones. TV, iPods, MP3s, DVD players, and video games compete for a child's attention even if parents limit their use. Technology's co-curricular impacts on kids are disputed by parents, teachers, and health specialists.

From walking, kids should balance tech and exercise. In “Media Education: What Parents Can Do,” the American Academy of Pediatrics says you're your child's best role model.

Turn off the TV during dinner, limit computer and video game use, and exercise together. Many parents engage their child in gymnastics or recreational football to avoid media and make friends. Disconnect your youngster from electronics.

Unless you transfer your family to a cave, technology will continue. Fitness and technology balance may help. Online videos teach most kids' preferred sports. Kid can play basketball after watching the basics. Play bowling, soccer, and dance online. Despite exercising, your kid won't ride down the block without his favorite songs. Perhaps Google Maps offers unusual treadmill routes for his jogging. Combine their best. Cocurricular promote intellect, emotion, social, moral, and art. Personality development and co-curriculars increase creativity, excitement, and optimism. Kids establish identities through co-curricular activities (CCAs), previously ECAs. Co-curriculars improve youngsters emotionally, physically, spiritually, and ethically.

Co-curricular enhance Core Curriculum. Schools must improve curriculum and character development. Afterschool activities are extracurricular. Diverse co-curriculars develop children's cultural, social, and aesthetic skills. Cocurricular provides hands-on experience. Engaging co-curriculars relating to the classroom topic reinforce theory. The classroom develops academic individuality, but co-curriculars enhance aesthetic, character, spiritual, physical, moral, creative, and other skills. These acts define language and character. Coordination, flexibility, linguistic fluency, and extempore expression improve in school and college. Co-curriculars started slowly, with many perceiving them as a fad (Millard, 1930). Millard (1930) advised co-curriculars to “grow out of curricular activities and return to curricular activities to enrich them” wherever possible. Many, especially educators, took time to grasp co-curriculars' benefits. Before 1900, educators believed "school should focus solely on narrowly defined academic outcomes" and viewed co-curriculars skeptically.

Banned fun non-academic activities because they harm academic performance (Marsh & Kleitman, 2002; Ahmad et al., 2023). According to early co-curricular specialists Deam and Bear, “co-curricular activities supplement and extend those contacts and experiences found in the more formal part of the program of the school day” (Millard, 1930). Marsh and Kleitman (2002) state that “educational practitioners and researchers have taken a more positive perspective, arguing that co-curricular activities may have positive effects on life skills and may also benefit academic accomplishments." Educational achievement was always affected by co-curriculars. Do co-curriculars affect academic success today?

Many studies link co-curriculars to academic success. TEAP is linked to higher GPAs, educational goals, college attendance, and fewer absenteeism (Broh, 2002). Guest and Schneider (2003) say “Researchers have found positive associations between co-curricular participation and academic achievement”. Although the details are debated, researchers believe that co-curriculars affect academic achievement. National Educational Longitudinal Study: “participation in some activities improves achievement, while participation in others diminishes achievement” (Broh, 2002; Naeem et al., 2022; Khadim et al., 2023).

Numerous non-academic co-curriculars boost academic performance (Marsh & Kleitman, 2002: Ali et al., 2023). Marsh & Kleitman (2002) found that "many studies showed

that students in co-curricular activities did better academically". Research has explored adolescent co-curriculars and academic success. According to Darling et al., (2005), “adolescents who participated in co-curricular activities reported higher grades, more positive attitudes towards school, and higher academic aspirations.

Darling et al., (2005) examined how co-curriculars affect growth and academic achievement in longitudinal research. Students were surveyed about their 20 co-curricular activities from the year. Demographic questions included favourite activity, gender, and ethnicity to account for sociocultural influences on results. Questions included GPA and academic ambitions. School-based co-curriculars raised grades, aspirations, and attitudes. Numerous studies show co-curriculars improve student performance. Are co-curriculars responsible for academic influence regardless of outside or social factors? Guest and Schneider (2003) examined social factors in academic and extracurricular achievement. Most studies on these two factors ignored the meaning co-curriculars “[held] for individual participants within distinct social contexts”. They assumed each school and community liked certain activities. Academic development depends on activity value (Guest & Schneider, 2003; Akram et al., 2022; Shah et al., 2024; Imran et al., 2023; Dahri et al., 2021).

Guest and Schneider (2003) say three things affect this relationship. These are “what,” “where,” and “when”. Guest & Schneider (2003) say “the type of participation or activity undertaken influences developmental outcomes”. The “where” means “that the school and community context in which co-curricular activity takes place matters” (Guest & Schneider, 2003; Katyara et al., 2022)? Finally, “when” means “the developmental and historical context in which co-curricular participation takes place influences both how it is valued and its effects on subsequent development” (Guest & Schneider, 2003; Dilshad et al., 2023; Imran, & Akhtar, 2023; Ahmed et al., 2023).

Each component affects co-curricular activity participation and academic achievement because they value activities and academics differently. After school, there are homework, outdoor, artistic, and brunch clubs. We classify clubs. Improved education and Co-curriculars. Their difference? Schoolwork, reading, science, math, and acting clubs are Co-curriculars. These services help students study and complete assignments. Pleasant teachings keep students in school. Activities that enhance the curriculum increase skills and practice, not academics. Some outdoor workouts improve health, mood, and relationships.

Students can join dance, acting, singing, athletics, debating, arts, and crafts organizations. Through various exercises, students discover workforce people and working skills. Using sociological ideas like E. Durkheim's functionalist theory states, "The carefully constructed curriculum helps students develop identities and self-esteem." Cliffsnotes.com says universal education gives future generations basic abilities.

2.1 Hypotheses

1. There is no relationship between technology and Students’ Academic Performance.
2. There is a relationship between technology and Students’ Academic Performance.
3. There is no relationship between Co-curricular Activities and Students’ Academic Performance.

4. There is a relationship between Co-curricular Activities and Students' Academic Performance.
5. Technologies and Co-curricular Activities have no impact on Students' Academic Performance.
6. There is an Impact of Technologies and Co-curricular Activities on Students' Academic Performance.

3. Methodology

Quantitative research was performed to acquire data from the questionnaire. The researcher used descriptive research and simple random sampling to describe the relationship between technologies, co-curricular activities, and student academic performance and determine their impact. Statistical methods were utilized to analyze the research using SPSS. This quantitative study explored how technologies and co-curriculars affect academic performance. The researcher collected primary data from undergraduate students at public and private universities and colleges using a 5-point Likert scale poll.

A survey questionnaire was used to collect data on a 5-point Likert scale in this investigation. From strongly agree (SA) to strongly disagree (SD), based on research objectives and questions, to determine how technologies and co-curricular activities affect students' academic achievement. The researcher obtained permission from undergraduate students from public and private universities and colleges in Karachi, Pakistan. This survey includes undergraduate students from public and private institutions and universities in Karachi, Pakistan. To survey public and private sector institutions, the researcher used simple random sampling, a subset of a statistical population with an equal probability of being chosen, with a sample size of 200.

The literature-based review questionnaire from the empirical study was used for this investigation. This study had four sections: Section A asked for basic participant information, Section B asked about using technology to improve and affect students' academic achievement, Section C asked about co-curricular activities' relationship and impact on academic performance, and Section D asked about learning and improving academic performance through technology and co-curricular activities. The questionnaire was graded on a quantitative scale: strongly agree (SA), agree (A), neutral (N), disagree (DA), and strongly disagree. The research was influenced by the results of each questionnaire. The researcher employed Pearson's correlation and regression analyses to investigate the association between technology, co-curricular activities, and students' academic performance. The researcher employed the measures of mean and standard deviation to characterize the respondents, utilized frequency distribution to summarize the data in tables and pie charts, employed Pearson's correlation to examine associations, and conducted regression analysis to assess the influence of technology, co-curricular activities, and student academic achievement.

4. Results

This study was founded on the idea that using technology and co-curricular activities influences undergraduate students' academic performance, which can improve it greatly. The study examined how technologies and Co-curricular affect undergraduate academic achievement. Survey questionnaire quantitative analysis results are shown in this chapter. To reach the result, the researcher uses Pearson Correlation to investigate the relationship between technology and co-curricular activities and Regression analysis to examine how they affect students' academic performance.

4.1 Respondent Profile

The research participants of this study were 200 students enrolled in public and private universities at graduate and undergraduate levels. In the Respondent profile, the researcher described the Gender, Age, and Qualification of the participants through descriptive and frequencies.

4.2 Descriptive Statistics

The demographic information attained by respondents of this research is comprised of three main basic information i.e., Age, Gender, and Qualification.

Table No: 1 Descriptive Statistics

	N	Min	Max	Mean	Std. deviation
Age	200	1	3	1.7300	0.80644
Gender	200	1	2	1.9550	0.20782
Qualification	200	1	2	1.5650	0.49700

The descriptive statistics of the demographics can be illustrated as the Mean of Age is (1.7300), the standard deviation is (0.80644), the mean of Gender is (1.9550), the standard deviation is (0.20782), and the mean of Qualification is 1.5650), standard deviation (0.49700) respectively.

4.3 Frequency

There are three measures of demographic information presented in this Questionnaire i.e., Age, Gender, and Qualification. The frequencies of these three measures can be better illustrated through tables and pie charts.

Table No 2: Frequency of Age

		Frequency	Percent
	17-20	99	49.5
	21-24	56	28.0
	25-30	45	22.5
Valid	Total	200	100.0

In terms of age among the 200 respondents respond to the questionnaire where 99 (49.5%) were at the age of (17-20), 56 (28.0%) were at the age of (21-24) and 45 (22.5%) were reported at the age of (25-30).

Table No 3: Frequency of Gender

		Frequency	Percent
Valid	Male	9	4.5
	Female	191	95.5
	Total	200	100.0

Regarding to the Gender of the particular respondent out of 200 participants there were 9 (4.5%) were Males and 191 (95.5%) were Females which were enrolled from public and private universities of Karachi, Pakistan at graduate and undergraduate level.

Table No 4: Frequency of Qualification

		Frequency	Percent
	Graduate	87	43.5
	Undergraduates	113	56.5
	Total	200	100.0

According to the respondents Qualification 200 participants there were 87 (43.5%) were Graduates and 113 (56.5%) were Undergraduate students.

3.5 Descriptive Analysis

The findings of the research study are based on three major parts of the survey Questionnaire asked i.e., Technologies, Co-Curricular activities, and Students Academic Performance.

Table No 5: Descriptive Statistics

Variables	Mean	Std. Deviation
TECH	19.3150	6.15183
COCURR	16.0250	4.67049
SAP	32.2850	8.84051

The descriptive statistics of this study stated that the value of mean can be shown in the above table for Technologies (M=19.3150) and (St.dev =6.15183), for Co-Curricular activities (M=16.0250) and (St.dev=4.67049) and for Students Academic Performance (M=32.2850) and (St.dev =8.84051).

4.4 Reliability

The reliability of the items was based on each variable of the study i.e., Technologies, Co-Curricular Activities, and Students' Academic Performance.

Table No: 6 Reliability

Variables	Items	Cronbach's Alpha
Technologies	10	0.800
Co-curricular Activities	10	0.832
Students' Academic Performance	20	0.900

Sekaran (2005) states that Cronbach's Alpha is the predominant and dependable coefficient utilised for assessing the reliability of several Likert questions in a survey questionnaire. Each question was rated on a 5-point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree". A Cronbach's Alpha analysis was conducted on a sample consisting of 40 items.

Table 6 demonstrates that the values of Cronbach's Alpha exceed 0.8, indicating a significant degree of internal consistency and data reliability. Based on the reliability of this study, the components have a value of 0.900, indicating that all elements in this research study are dependable and highly suitable for further investigation.

4.5 Analysis of Research Objectives One and Two

The Person's Correlation test was conducted to analyze the relationship between the variables. The primary aim of this research study was to investigate the correlation between Technologies and Students' Academic Performance at both the Graduate and Undergraduate levels. The secondary objective was to examine the association between Co-curricular Activities and Students' Academic Performance. These objectives were formulated into research questions: "Is there a relationship between Technologies and Students' Academic Performance?" and "Is there a relationship between Co-Curricular Activities and Students' Academic Performance at the Graduate and Undergraduate levels?". Additionally, the Research Questions were transformed into a Hypothesis.

4.6 Correlation

Table No: 7 Correlation

		TECH	COCURR	SAP
TECH	Pearson Correlation	1		
	Sig. (2-tailed)			
COCURR	Pearson Correlation	.588**	1	
	Sig. (2-tailed)	.000		
SAP	Pearson Correlation	.531**	.633**	1
	Sig. (2-tailed)	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

Based on Hair's (2005) research, Pearson's correlation coefficient (r) was used to analyze the data and determine the link between each variable. The study aimed to find a

significant impact of technologies & co-curricular activities on students' academic Achievement, employing a significance level of less than 0.01 for a two-tailed test. In the provided table, the correlation for Technologies (TECH) is r = 0.588, with a p-value of 0.000< 0.01. This indicates a substantially strong positive link between Technologies and Students Academic Performance. Therefore, based on the p-value analysis, we have rejected the null hypothesis and accepted the alternative hypothesis.

The second objective of this research study, as indicated in the table above, reveals a coefficient of Co-curricular Activities (COCURR) of r = 0.633, with a p-value of 0.000< 0.01. This indicates a significantly strong positive relationship between Co-Curricular Activities and Students Academic Performance. Therefore, based on the p-value, we can conclude that the null second hypothesis is rejected and the alternative hypothesis is accepted.

Correlation research reveals that Co-Curricular Activities exhibit a stronger positive and significant association with Students' Academic Performance, while Technologies demonstrate a moderate positive and strong significant relationship with Students' Academic Performance.

4.7 Analysis of Research Objective Three

The primary aim of this research project was to investigate the influence of technologies and co-curricular activities on the academic performance of graduate and undergraduate students. The research topic posed was: "Does the utilization of technologies and participation in co-curricular activities have any effect on the academic performance of graduate and undergraduate students?" Additionally, the Research Question was transformed into a Hypothesis. The third Alternative Hypothesis of the research study posited that "Technologies and co-curricular Activities have an impact on the Academic Performance of students at both the Graduate and Undergraduate Levels." The null hypothesis states that there is no effect of technologies and co-curricular activities on the academic performance of students at both the graduate and undergraduate levels. The hypothesis of this study was centred around the dependent variable, which was the academic performance of students. The independent variables considered were technologies and co-curricular activities. In order to test the Hypothesis, linear regression was employed to obtain additional insights. The results of regression are presented below:

4.8 Model Summary

Table No 8: Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.663a	.439	.434	6.65348

a. Predictors: (Constant), TECH, COCURR

b. Dependent Variable: SAP

In table no 8, the "R" score in the table above illustrates how well the Dependent Variable (Students' Academic Performance) predictions match the actual values. The number "R Square," indicates our model's quality. The coefficient of determination. It appears that "R Square" is 0.439. Technologies and Extracurricular Activities explain 43.9% of the difference

in Students' Academic Performance. If you can make additional model adjustments, updated R-Square provides you a more accurate fit assessment.

4.9 ANOVA

Table No 9: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6831.810	2	3415.905	77.163	.000b
	Residual	8720.945	197	44.269		
	Total	15552.755	199			

a. Dependent Variable: SAP

b. Predictors: (Constant), TECH, COCURR

In table no 9, the test results for the analysis of variance are shown in the table above. There are three rows in the manner that the results are shown. The first row, called "Regression," shows how much of the model's variation can be explained by known factors. The variation due to random error or unknown causes is shown in the second row, which is called "Residual." This time, the p-value is 0.000, which is less than 0.05, and the F-value is 77.163. The alternative hypothesis won over the null hypothesis, which meant that the mean of Technologies and Extracurricular Activities is not the same as the mean of Students' Academic Performance.

4.10 Coefficient

Table No 10: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	10.811	1.795		6.023	.000
TECH	0.369	0.100	0.242	3.671	.000
COCURR	0.929	0.125	0.491	7.438	.000

a. Dependent Variable: SAP

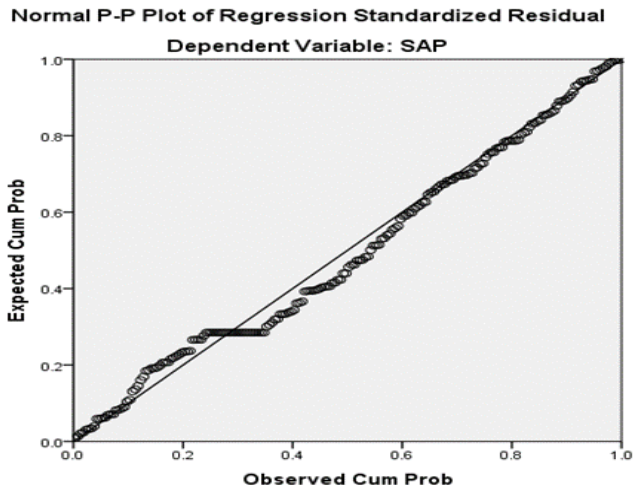
For this research study, a coefficient is a way to find out what the statistical value of each variable is. The above coefficient table shows the number of the constant and the coefficient. This table is important. Using the regression coefficient and the fixed term in column B, one can make the equation for the variable that is being predicted, which is Student's Academic Performance. In this way, we can write the regression equation:

SAP = (10.811) + (0.369) TECH+ (0.929) COCURR

Now after testing our hypothesis, we see that in the above table, the *p-value* of the regression coefficient is given by 0.001 which is <0.05, in this case, we can reject our Null hypothesis and accept our Alternative hypothesis. Here we concluded that the regression coefficient is not Zero. The Standardized Residuals histogram, as seen above, displays the model's residual's mean and standard deviation. The fitted model was successful, and the margin of error is small, since the mean is close to zero and the standard deviation is about one.

4.11 Normal P-Plot of Regression Standardized Residual

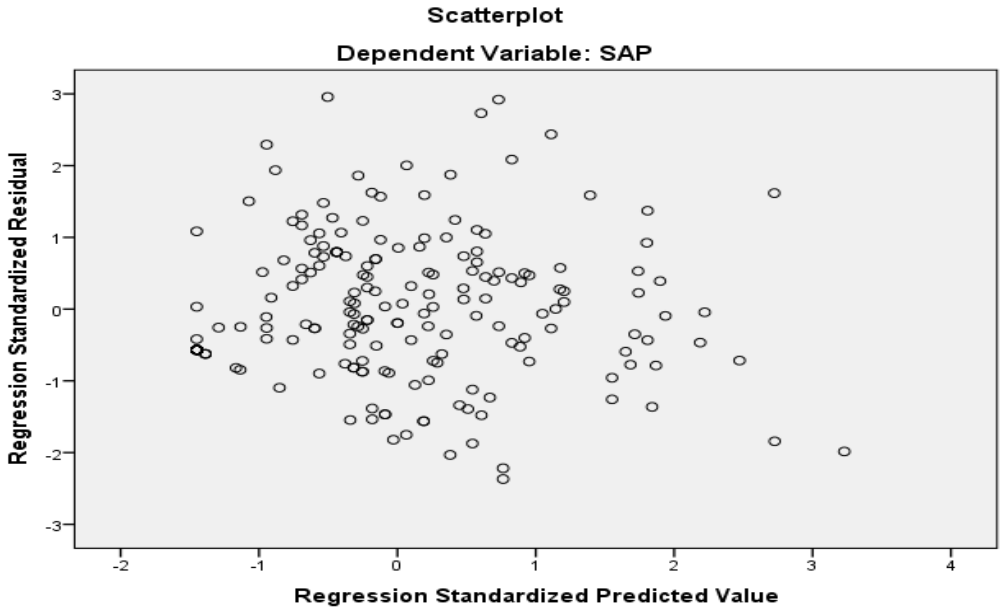
Figure No 1: Normal Probability Plot



The above normal probability plot of regression standardized residual shows the regression line which touches a maximum number of points present in the model and it also shows the accuracy of the fitted model.

4.12 Scatter Plot

Figure No 2: Scatter Plot



The above-scattered plot also shows the adequacy of the fitted model as we can see that the data is scattered and does not follow any particular pattern. So, we can say that the fitted model has minimum chances of error. That shows that the hypothesis states to be corrected and applicable.

4.13 Discussion

Co-curricular and tech-using students usually do well academically. Students, administrators, instructors, and parents must understand how co-curricular activities and technology affect academic success. They must also know what co-curricular activities and technology are available and how they affect academic success. Not every youngster will benefit or be disadvantaged, as studies showed after these exercises. Students perform at their level of competence, so one cannot anticipate excessive academic talents from a student who is interested in many activities. Parents must be careful not to compel their children to participate in activities to improve academic performance. Kids likes, dislikes, and interests. Some hobbies suit their personalities, while others don't. Parents should identify pupils' interests and strengths and let them pursue them. Parents shouldn't restrict their kids from co-curriculars. Such activities can help students build social, life, and talent skills as well as academic skills.

Co-curricular activities help students develop academically, socially, physically, and cognitively, and every child should be able to join one that suits their interests. These activities should improve their growth and require mental and/or physical ability. Technologies like cell phones, laptops, and computers can impair their talents, abilities, and competencies. It's not always beneficial and should be limited. Parents should let their kids choose their activities but nonetheless control their time. Parents can help their young children succeed academically by getting them involved in academically beneficial activities. This may affect their future activity choices and set the stage for academic achievement.

Results and analysis were previously presented. The study's major findings on how technologies and co-curricular activities affect student learning were summarized based on current literature. These findings were important for college and university executives, researchers, students, and educational policymakers because they informed program options.

5. Conclusion

This study found a positive correlation between co-curricular activities and academic success (Jabeen et al., 2023). Zehner found that co-curricular activity participation increased student engagement and academic achievement (Zehner, 2011; Thomas et al., 2022). A study in India found that schools with more activities have better math’s performance (Chudgar, Chandra et al., 2015; Aslam et al., 2022). A study of co-curricular activity number, intensity, and intensity-number interaction found that more activities improve academic achievement. An increase in activities may boost academic achievement. These findings support Reeves (2008). Reeves analyzed Midwestern high school students' co-curricular engagement. In 2008, Reeves reported that 65 academic performances and high school graduation rates increased with co-curricular activities. The length of time a student spent in co-curricular activities positively affected GPA. The more intellectual co-curricular activities pupils participated in, the better their academic success.

5.1 Recommendations

The current study does not provide us with a comprehensive understanding of these findings. Further investigation is required to delve into the matter. It would be beneficial to offer a more precise comprehension of the mechanism by which the quantity of activities and

level of involvement impact academic results. This offers a prospect for future investigation. In order to boost students' learning, universities should adopt and integrate technologies and co-curricular activities to augment the knowledge, skills, and capabilities of their students.

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