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Examining the Impact of AI Virtual Assistants on the Study Habits of College Students: A Case Study of Thrissur District

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Abstract: *The 21st century has experienced a tremendous pace of technological development, and the so-called Artificial Intelligence (AI) became one of the most disruptive agents in a broad range of spheres, education being one of them. AI has transformed the man-to-machine interaction in that machines can now imitate human intelligence by learning, reasoning, and by self-correcting. One of the most renowned instances of AI use is the software agent of virtual assistants that can execute tasks or services upon request or query by the user. Examples that are popular consist of Siri, the product of the Apple company, Google Assistant, Alexa of the Amazon company and Cortana of the Microsoft company, as well as more recently ChatGPT and other chatbot-like AI systems.*

Introduction

In the learning environment, AI virtual assistants have become quite common among students in their learning processes. What used to be only possible by using textbooks and notes to research manually, has now turned into immediate information available at the touch of a button by a word or typed query. They can now get a virtual assistant to define vocabulary, to summarize materials, to translate texts, write essays, to schedule study sessions and even translate complicated topics of science in simplified languages. This availability has established AI tools as a one-on-one and easy-to-use learning companion among most learners. Although some teachers and students talk glowingly of AI based on its effectiveness and capacity to facilitate individual learning, some others believe that over reliance on these applications may lead to a personality deficiency in students that can result in weak critical thinking, creativity, and problem-solving capacity. The rising popularity of AI virtual assistants, in turn, seems to possess a dual aspect with opportunities and challenges to academic development.

The customized learning experience that AI virtual assistants provide will enable students to learn at the same pace and learners can revisit concepts when it is necessary and get customized explanations depending on their understanding ability. Such a flexibility makes it more engaging and encourages to learn independently, particularly when combined with students who might not learn well in

a traditional classroom environment. Furthermore, in the era of globalization where digital literacy is a prerequisite, AI programs can ensure that students gain necessary technological skills that can equip them with the needs of present-day academic and employment requirements. Students also learn to use AI as a part of their studying process, so they can communicate with new technologies properly, (which is becoming an important asset to offer in the contemporary job market, as well.) In spite of these benefits, the fact that too much reliance is being put on AI is becoming an issue of concern. Students who rely on virtual assistants too extensively to be academically assisted might become demotivated to conduct literature research independently and resort to critical thinking. Thus, although AI is a phenomenon with outstanding opportunities, it is essential to comprehend how this technology is determining the learning habits of students and whether it is indeed improving or undermining their academic development.

Including the digital natives, students are becoming up to date with technology. The smartphone, tablet, and AI-driven applications have become a part of their lives at school and in personal sphere. The virtual assistants of AI are particularly attractive to students due to their user-friendly features and the interactive interface. This technological comfort has brought about a strong transformation in the study behavior and habits of students with regard to learning. Most students have been enabling AI assistants to create study materials, update lessons, and even exam prepares. Virtual assistants can also help in time management, assisting students in scheduling their activities and reminders and enhancing order and educational discipline. To say the least, a student may call on Google assistant to draw up a studying plan, or ChatGPT to solve a mathematical problem step-wise.

With the growing use of AI in education, there is a need to explore the impact virtual assistants have on the cognitive and behavioural learning processes of students. The rationale behind this study is that despite the considerable benefits AI virtual assistants provide in education, they can also perpetuate passive learning and decrease cognitive processing if not used in moderation. The aim of this study is to understand the impact that AI virtual assistants have on student learning and how they may develop motivation, self-discipline and understanding or dependency and an "academic crutch". This is important for students, educators, parents and policy makers in fostering the responsible use of technology in education.

In conclusion, the growing use of AI virtual assistants by students mirrors the trend towards technologically supported learning. These assistants offer the potential to transform education with their accessibility, personalization and efficiency, but also the issue of academic reliance and learning engagement. Through examining the impact of AI virtual assistants on learning behaviours, this research aims to provide insight on how technology can be better used as a tool rather than a substitute for learning. Finally, the study highlights the importance of striking the right balance in the use of AI in education, with students taking charge of their learning and leveraging these smart tools to complement their learning rather than replace their efforts and understanding.

Literature Review

L. H. Chen (2025)[1] in their study titled "Impacts of AI Chatbots on Students Learning Outcomes" investigated that (collaborative) learning with AI chatbots has resulted in reflection, critical thinking, creativity and problem-solving skills being enhanced in students. This research highlights the viability of adopting AI chatbots for improving different learning dimensions. Quratulain, **Saira Maqbool & Sara Bilal (2025)[2]** in their study entitled "The Effectiveness of AI-Powered Writing Assistants in Enhancing Essay Writing Skills at Undergraduate Level" pointed out that AI writing tools such as Grammarly and ChatGPT have improved the writing accuracy, cohesion, vocabulary and structure of undergraduate students. However, the authors cautioned against reliance on and cheating issues using AI. **A. Letourneau (2025)[3]** in her study entitled "A Systematic Review of AI-Driven Intelligent Tutoring Systems" revealed that AI intelligent tutoring systems (ITS) and AI assistants often change study habits by providing immediate corrective feedback and personalised practice and discouraging cramming in favour of frequent short study sessions. **B. Klimova (2025)[4]** in her study entitled “Exploring the Effects of Artificial Intelligence on Student and Teacher Experiences” found that virtual mentors make study more equitable and support students with special learning needs to follow regular study routines, but caution that teachers must support the use of virtual mentors to prevent dependence. **Y. Heung (2025)[5]** in his study entitled "How ChatGPT Impacts Student Engagement: A Meta-Analysis" found that generative AI can boost behavioral and cognitive engagement and some students establish regular study habits when interacting with AI study assistants. **T. Matos (2025)[6]** in his study entitled “A Systematic Review of AI Applications in Education” reported that the use of AI assistants frequently leads to regular formative practice and real-

time feedback, resulting in more "learning by doing" study habits. **A. M. Vieriu (2025)[7]** in his study entitled "The Impact of Artificial Intelligence (AI) on Students Academic Performance" also stated that AI brings valuable benefits such as personalization, improved academic performance and student engagement. The research stresses the need to incorporate AI to cater to different learning styles and elevate learning.

Linlin Fang (2024)[8] in her study entitled "Exploring the Impact of Artificial Intelligence-Based Assistants in Modern Education: The Case of ChatGPT" discussed that the use of ChatGPT enhanced student motivation, active engagement, and enriched learning outcomes, especially through personalised learning. But it also found there were risks associated with dependency and that certain subject areas fared better than others. **Akbar (2024)[9]** in his study entitled "Effect of Using AI on Changes in Habits in Completing Academic Assignments" suggested that students who are more technologically literate and have better technological skills in using AI experienced positive change in their study habits. They spend less time and achieved better results in their assignments. **Batsaikhan & Ana-Paula Correia (2024)[10]** in their study entitled "The Effects of Generative Artificial Intelligence on Intelligent Tutoring Systems in Higher Education: A Systematic Review" reasoned that implementative generative AI has potential to better intelligent tutoring systems (ITSs) in STEM courses to increase responsiveness, adaptability and personalisation. It also noted issues regarding the maintenance of accuracy, misuse and pedagogical goals.

G. Hanshaw (2024)[11] in his study entitled "Exploring the Effectiveness of AI Course Assistants on Student Learning Experiences" found that students provided with access to AI course assistants report increased homework completion, problem solving and self-confidence in day-to-day tasks, but variable impacts on conceptual learning. **R. Deng (2024)[12]** in the study "Does ChatGPT Enhance Student Learning? A Systematic Review" found ChatGPT frequently lowers the cognitive load and accelerate task solving, this can help improve short-term learning outcomes and promote more revisit in study, but it can also lead to shallow learning if used as a crutch. **S. Wang (2024)[13]** in his study entitled "Artificial Intelligence in Education: A Systematic Literature Review" discussed that AIED technologies (including virtual assistants) support adaptive practice and supported revision, encouraging students to engage in spaced practice as well as more frequent engagement in self-regulated learning strategies.

M. Abbas (2024)[14] in his study entitled "Is it Harmful or Helpful? Understanding the Factors and Impacts of ChatGPT Use" noted that ChatGPT use is associated with less student procrastination (as it makes things easier to start) but can lead to gamification (cheating) and few benefits for deep learning. **Goyal, Minz & Sha (2024)[15]** in the study entitled "Chatbots and Virtual Assistants in Education: Enhancing Student Support and Engagement" suggested virtual assistants availability 24/7 affects the way students learn, and students tend to study more in a just-in-time manner rather than in blocks. **C. Zhai (2024)[16]** in the study entitled "The Effects of Over-Reliance on AI Dialogue Systems on Students Writing Skills" believed AI has positive impacts on students' writing skills, confidence and understanding of academic integrity.

Sruti Mallik & Ahana Gangopadhyay (2023)[17] in their study entitled *"Proactive and Reactive Engagement of Artificial Intelligence Methods for Education: A Review"* opined that AI and ML methods have been used both proactively (e.g., course planning, admissions) and reactively (e.g., assessments, feedback) in education; and that the COVID-19 pandemic accelerated uptake. However, many studies still lack empirical focus on long-term changes in learning and study habits. **Sukhpal Singh Gill (2023)[18]** in his study entitled *"Transformative Effects of ChatGPT on Modern Education: Emerging Era of AI Chatbots"* stated that ChatGPT and similar chatbots can support educators in creating instructional content, helping students through group work, and acting as online tutors. But also raised concerns about hallucinations (incorrect information), plagiarism, and the need to update institutional evaluation systems.**L. Labadze (2023)[19]** in his study entitled *"Role of AI Chatbots in Education: Systematic Literature Review"* opined that AI chatbots primarily support homework/study assistance, personalization of learning, and increased practice opportunities, and that these affordances tend to shift student study habits toward more frequent, on-demand study episodes.**R. Gubareva (2020)[20]** in the study entitled *"Virtual Assistants for Learning: A Systematic Literature Review"* highlighted that virtual assistants can aid students in time management, prioritization, and studying effectively at the university level. The review highlights the potential of virtual assistants to support freshmen in adapting to academic demands.

Significance of the Study

The study is important as it offers a better understanding of the impact of artificial intelligence, in the form of virtual assistants like Siri, Google Assistant, Alexa and ChatGPT, on the learning and studying practices of undergraduate students. In an age where technology is prominent in education, it is essential to understand ways in which these artificial intelligence tools are helping and hindering learning to educate families, teachers, and leaders to use them in a constructive way. The study's insights will help educators find opportunities to use AI assistants as helpful learning tools to reduce negative student outcomes such as dependency. For students, the research will be an eye-opener, making them ponder their learning habits and evolve effective independent, self-disciplined study habits that take the best from technology and cognitive processes. Furthermore, the research will also help educational institutions and AI technology developers by providing them with insights into how to improve and build tools that can improve learning and students' academic development. In general, the study will help to understand the impact of AI in the future of education and set the stage for discussion on the ethical and practical deployment of technology in the education space.

Statement of the Problem

As artificial intelligence continues to rapidly advance, students increasingly use virtual assistants, like Siri, Google Assistant, Alexa, and ChatGPT for quick information, reminders and when they study. Although such technologies offer speed and efficiency in the learning process, there is a concern about the potential effects of their growing popularity on students study habits. While some students use these to better study and organise their time, others might become addicted to these, and have reduced capacity for independent thinking and learning. So, what is the influence of AI virtual assistants on students' studying habits? Specifically, the research problem in this study is to clarify how the use of AI virtual assistants might influence students' study habits, through the accessibility of such technology, either in a positive sense by improving discipline and learning, or in a negative sense by encouraging passive learning and a dependency on technology. This needs to be understood to ensure that AI becomes a tool for enhancing learning rather than circumventing efforts and critical thinking.

Objectives of the Study

- To study the level of awareness and usage of AI virtual assistants among students in their academic activities.
- To identify the key factors influencing students' usage of AI virtual assistants in their study habits.
- To study the level of satisfaction of students with AI virtual assistants as a learning aid.
- To study the common problems and challenges faced by students while using AI virtual assistants for academic purposes.
- To study the relationship between the frequency of AI virtual assistants' usage and improvements in students study performance.

Hypothesis

H_0: There is no relationship between age and improvement in study performance.

H_0: There is no relationship between gender and improvement in study performance.

H_0: There is no relationship between course/program and improvement in study performance.

H_0: There is no relationship between frequency of AI virtual assistants usage and improvement in study performance.

Research Methodology

The study will be descriptive and analytical in nature. Both primary and secondary data has been used for the purpose of the study. The primary data collected from the students through structured questionnaire. Secondary sources of information like books, journals, websites etc…are also used for the study.

- **Population:** Population for the study consists of college students of Thrissur district.
- **Sampling Frame:** College students of selected municipalities in Thrissur district.
- **Sample Unit:** Each student in the sample frame.
- **Sample Size:** The study is conducted among 60 respondents.
- **Method of Sampling:** The method of sampling used for data collection is convenient sampling.

- **Tools for Data Analysis:** The data collected is analysed by using Simple Percentage Analysis Method, Likert Scale, Ranking Method and Chi-Square Test.
- **Tools for Presentation:** The data has been presented using Tables, Graphs, Charts and Diagrams.

Scope of the Study

The research seeks to understand the role of AI-powered virtual assistants in the study patterns of college students, especially how they influence the students learning styles, time management skills, and discipline. The study will be conducted among college students who regularly utilise AI-based virtual assistants like Siri, Google Assistant, Alexa or ChatGPT for learning. The research will look at the benefits and drawbacks of these assistants in terms of students' planning, organisational, and memory skills. The research is mainly focused on college students within the geographical boundaries, enabling a more comprehensive exploration of their thoughts and feelings. Although the study emphasises on the integration of AI assistants into students study schedules, it doesn't cover the use of AI for leisure or other non-academic purposes. The results will represent the educational role of virtual assistants within formal education, and will be a foundation for further larger-scale or more diverse student studies.

Limitations of the Study

- The area of the study is limited to a small area like Thrissur. So the results cannot be generalised.
- Some of the respondents were unwilling and reluctant to answer the questions.

Data Analysis

Table 1: Table showing Age Group of Respondents

Age	Number of Respondents	Percentage
17-19	8	13
20-22	36	60
23-25	14	24
Above 25	2	3
Total	**60**	**100**

(Source: Primary Data)

Table 2: Table showing Gender of Respondents

Gender	Number of Respondents	Percentage
Male	9	15
Female	51	85
Total	**60**	**100**

(Source: Primary Data)

Table 3: Table showing Course/Program of Study of Respondents

Course/Program	Number of Respondents	Percentage
Arts	6	10
Science	4	7
Commerce	45	75
Engineering	0	0
Management	2	3
Computer Applications	3	5
Total	**60**	**100**

(Source: Primary Data)

Table 4: Table showing Familiar AI Virtual Assistants of Respondents

AI Virtual Assistants	Number of Respondents	Percentage
Siri	7	12
Google Assistant	34	57
Alexa	10	17
ChatGPT	56	93
Cortana	1	2
Other	0	0
Total	**60**	**100**

(Source: Primary Data)

Table 5: Table showing Source of Learning about AI Virtual Assistants of Respondents

Source of Learning	Number of Respondents	Percentage
Friends or peers	16	27
Social media	35	58
School/College	5	8
Internet or advertisements	4	7
Total	**60**	**100**

(Source: Primary Data)

Table 6: Table showing Level of Awareness about AI Virtual Assistants of Respondents

Level of Awareness	Number of Respondents	Percentage
Very high	8	13
High	21	35
Moderate	30	50
Low	1	2
Very low	0	0
Total	**60**	**100**

(Source: Primary Data)

Table 7: Table showing Academic Activities where AI Virtual Assistants used

Academic Activities	Number of Respondents	Percentage
Searching for study materials or information	49	82
Making study schedules or reminders	17	28
Translating text or summarizing content	34	57
Writing essays or assignments	33	55
Answering academic questions	24	40
Other	0	0
Total	**60**	**100**

(Source: Primary Data)

Table 8: Table showing Level of Usage of AI Virtual Assistants

Level of Usage	Number of Respondents	Percentage
Low usage (Rarely/once a week)	5	8
Moderate usage (2-3 times a week)	35	58
High usage (Daily)	16	27
Very high usage (Multiple times a day)	4	7
Never	0	0
Total	**60**	**100**

(Source: Primary Data)

Table 9: Table showing Improvement in Overall Study Performance

Level of Improvement	Number of Respondents	Percentage
No improvement	0	0
Slight improvement	16	27
Moderate improvement	24	40
High improvement	19	31
Very high improvement	1	2
Total	**60**	**100**

(Source: Primary Data)

Table 10: Table showing Replacement of Traditional Learning Methods

Opinions	Number of Respondents	Percentage
Yes, completely	5	8
Partially	37	62
Not sure	14	23
No, never	4	7
Total	**60**	**100**

(Source: Primary Data)

Table 11: Table showing Level of Inaccurate Information

Levels	Number of Respondents	Percentage
Very often	4	7
Often	12	20
Sometimes	37	61
Rarely	7	12
Never	0	0
Total	**60**	**100**

(Source: Primary Data)

Table 12: Table showing Affect on Originality or Critical Thinking

Opinions	Number of Respondents	Percentage
Yes, significantly	17	28
To some extent	20	33
Neutral	22	37
Not really	0	0
Not at all	1	2
Total	**60**	**100**

(Source: Primary Data)

Table 13: Table showing Area of Improvement of AI Virtual Assistants

Areas	Number of Respondents	Percentage
Accuracy of information	14	23
Understanding academic context	11	18
Providing references	13	22
Language comprehension	4	7
Privacy protection	18	30
Total	**60**	**100**

(Source: Primary Data)

Table 14: Table showing Level of Satisfaction towards AI Virtual Assistants

Statements		HS	S	N	D	HD	Total	Mean
	W	**5**	**4**	**3**	**2**	**1**		
I am satisfied with the ease of using AI virtual assistants for academic tasks	**F**	**22**	**32**	**4**	**0**	**2**	**60**	4.20
	FX	110	128	12	0	2	252	
I am satisfied with the accuracy and usefulness of academic information provided by AI virtual assistants	**F**	**9**	**37**	**12**	**1**	**1**	**60**	3.87
	FX	45	148	36	2	1	232	
I am satisfied with the ability of AI virtual assistants to help in understand difficult topics	**F**	**14**	**20**	**23**	**2**	**1**	**60**	3.73
	FX	70	80	69	4	1	224	
I am satisfied with the support AI virtual assistants provide in helping in complete assignments efficiently	**F**	**16**	**21**	**13**	**7**	**3**	**60**	3.67
	FX	80	84	39	14	3	220	
I am satisfied with the overall improvement in learning experience due to AI virtual assistants	**F**	**9**	**27**	**15**	**5**	**4**	**60**	3.53
	FX	45	108	45	10	4	212	
I am satisfied with the overall performance of AI virtual assistants in studies	**F**	**10**	**29**	**15**	**6**	**0**	**60**	3.72
	FX	50	116	45	12	0	223	
I am satisfied with the usefulness of AI virtual assistants to the extent that would recommend them to other students	**F**	**8**	**31**	**14**	**4**	**3**	**60**	3.62
	FX	40	124	42	8	3	217	

(Source: Primary Data)

Table 15: Table showing Factors Influencing Students usage of AI Virtual Assistants

Factors	W	5	4	3	2	1	Total	Mean	Rank
Ease of use and accessibility	**F**	**33**	**9**	**7**	**5**	**6**	**60**	3.97	**1**
	FX	165	36	21	10	6	238		
Accuracy and speed of responses	**F**	**7**	**26**	**15**	**6**	**6**	**60**	3.37	**2**
	FX	35	104	45	12	6	202		
Helpfulness in completing assignments	**F**	**8**	**9**	**28**	**10**	**5**	**60**	3.08	**3**
	FX	40	36	84	20	5	185		
Curiosity or interest in technology	**F**	**6**	**10**	**6**	**33**	**5**	**60**	2.65	**4**
	FX	30	40	18	66	5	159		
Recommendations from peers or teachers	**F**	**6**	**6**	**4**	**6**	**38**	**60**	1.93	**5**
	FX	30	24	12	12	38	116		

(Source: Primary Data)

Table 16: Table Showing Challenges faced while using AI Virtual Assistants

Challenges	W	5	4	3	2	1	Total	Mean	Rank
Inaccurate or irrelevant answers	**F**	**24**	**6**	**10**	**9**	**11**	**60**	3.38	**1**
	FX	120	24	30	18	11	203		
Poor internet connection	**F**	**5**	**18**	**15**	**14**	**8**	**60**	2.97	**4**
	FX	25	72	45	28	8	178		
Difficulty using commands or features	**F**	**7**	**10**	**25**	**12**	**6**	**60**	3.00	**3**
	FX	35	40	75	24	6	180		
Overdependence on AI tools	**F**	**10**	**20**	**8**	**18**	**4**	**60**	3.23	**2**
	FX	50	80	24	36	4	194		
Privacy or data security concerns	**F**	**14**	**6**	**2**	**7**	**31**	**60**	2.42	**5**
	FX	70	24	6	14	31	145		

(Source: Primary Data)

Table 17: Relationship between Age of Respondents and Improvement in Study Performance

H_0: There is no relationship between age and improvement in study performance

H_1: There is a relationship between age and improvement in study performance

Age	No improvement	Slight improvement	Moderate improvement	High improvement	Very high improvement	Total
17-19	0	2	2	4	0	**8**
20-22	0	9	16	10	1	**36**
23-25	0	4	6	4	0	**14**
Above 25	0	1	0	1	0	**2**
Total	**0**	**16**	**24**	**19**	**1**	**60**

(Source: Primary Data)

Table 18: Chi-square Test

Observed frequencies(O)	Expected frequencies(E)	$(O-E)^2$	$(O-E)^2 / E$
11	11.73	0.533	0.0454
23	21.87	1.277	0.0584
6	5.60	0.160	0.0286
14	13.93	0.005	0.0004
6	5.67	0.109	0.0192
		X^2 =	0.1520

(Source: Primary Data)

Level of significance: 0.05 or 5%

Degree of freedom: (r-1) (c-1) = (4-1) (5-1) = 12

Table value at 5% level of significance and degree of freedom 12 = 21.026

Expected return = Row total * Column total / Total number of respondents

The calculated value (0.1520) is lesser than the table value (21.026), so we accept the null hypothesis (H0). So there is no relationship between Age and Improvement in Study Performance.

Table 19: Relationship between Gender of Respondents and Improvement in Study Performance

H_0: There is no relationship between gender and improvement in study performance

H_1: There is a relationship between gender and improvement in study performance

Gender	No improvement	Slight improvement	Moderate improvement	High improvement	Very high improvement	Total
Male	0	2	3	4	0	**9**
Female	0	14	21	15	1	**51**
Total	**0**	**16**	**24**	**19**	**1**	**60**

(Source: Primary Data)

Table 20: Chi-square Test

Observed Frequencies(O)	Expected Frequencies(E)	$(O-E)^2$	$(O-E)^2 / E$
19	19.60	0.360	0.0184
25	23.25	3.063	0.1317
16	17.00	1.000	0.0588
		X^2 =	0.2089

(Source: Primary Data)

Level of significance: 0.05 or 5%

Degree of freedom: (r-1) (c-1) = (2-1) (5-1) = 4

Table value at 5% level of significance and degree of freedom 4 = 9.488

Expected return = Row total * Column total / Total number of respondents

The calculated value (0.2089) is lesser than the table value (9.488), so we accept the null hypothesis (H0). So there is no relationship between Gender and Improvement in Study Performance.

Table 21: Relationship between Course/Program and Improvement in Study Performance

H_0: There is no relationship between course/program and improvement in study performance

H_1: There is a relationship between course/program and improvement in study performance

Course/Program	No improvement	Slight improvement	Moderate improvement	High improvement	Very high improvement	Total
Arts	0	3	0	3	0	**6**
Science	0	1	1	2	0	**4**
Commerce	0	11	21	12	1	**45**
Engineering	0	0	0	0	0	**0**
Management	0	0	1	1	0	**2**
Computer Applications	0	1	1	1	0	**3**
Total	**0**	**16**	**24**	**19**	**1**	**60**

(Source: Primary Data)

Table 22; Chi-square Test

Observed Frequencies(O)	Expected Frequencies(E)	$(O-E)^2$	$(O-E)^2 / E$
16	15.47	0.281	0.0182
24	21.60	5.760	0.2667
20	19.75	0.063	0.0032
		X^2 =	0.2881

(Source: Primary Data)

Level of significance: 0.05 or 5%

Degree of freedom: (r-1) (c-1) = (6-1) (5-1) = 20

Table value at 5% level of significance and degree of freedom 20 = 31.410

Expected return = Row total * Column total / Total number of respondents

The calculated value (0.2881) is lesser than the table value (31.410), so we accept the null hypothesis (H0). So there is no relationship between Course/Program and Improvement in Study Performance.

Table 23: Relationship between Frequency of AI Virtual Assistants Usage and Improvement in Study Performance

H_0: There is no relationship between frequency of AI virtual assistants' usage and improvement in study performance

H_1: There is a relationship between frequency of AI virtual assistants' usage and improvement in study performance

Frequency/ Usage	No improvement	Slight improvement	Moderate improvement	High improvement	Very high improvement	Total
Low usage	0	5	0	0	0	**5**
Moderate usage	0	7	19	9	0	**35**
High usage	0	4	5	6	1	**16**
Very high usage	0	0	0	4	0	**4**
Never	0	0	0	0	0	**0**
Total	**0**	**16**	**24**	**19**	**1**	**60**

(Source: Primary Data)

Table 24: Chi-square Test

Observed Frequencies(O)	Expected Frequencies(E)	$(O-E)^2$	$(O-E)^2 / E$
16	14.93	1.145	0.0767
24	20.40	12.960	0.6353
20	17.69	5.336	0.3016
		X^2 =	1.0136

(Source: Primary Data)

Level of significance: 0.05 or 5%

Degree of freedom: (r-1) (c-1) = (5-1) (5-1) = 16

Table value at 5% level of significance and degree of freedom 16 = 26.296

Expected return = Row total * Column total / Total number of respondents

The calculated value (1.0136) is lesser than the table value (26.296), so we accept the null hypothesis (H0). So there is no relationship between Frequency/Usage and Improvement in Study Performance.

Findings of the Study

- 13 percentage of respondents belong to 17-19 years of age, 60 percentage of respondents belong to 20-22 years of age, 24 percentage of respondents belong to 23-25 years of age and only 3 percentage of respondents belong to above 25 years of age.
- 15 percentage of respondents are male and 85 percentage of respondents are female.
- 10 percentage of respondents belong to arts, 7 percentage of respondents belong to science, 75 percentage of respondents are from commerce background, 3 percentage of respondents belong to management and 5 percentage of respondents belong to computer applications.
- 12 percentage of respondents are familiar with siri, 57 percentage of respondents are familiar with google assistant, 17 percentage of respondents are familiar with alexa, 93 percentage of respondents are familiar with chatgpt and only 2 percentage of respondents are familiar with cortana.
- 27 percentage of respondents heard about AI virtual assistants from friends or peers, 58 percentage of respondents from social media, 8 percentage of respondents from school/college and only 7 percentage of respondents from internet or advertisements.
- 13 percentage of respondents have very high level of awareness, 35 percentage of respondents have high level of awareness, 50 percentage of respondents have moderate level of awareness, 2 percentage of respondents have low level of awareness and none of them are unaware.
- 82 percentage of respondents used AI virtual assistants for searching study materials or information, 28 percentage of respondents used for making study schedules or reminders, 57 percentage of respondents used for translating text or summarizing content, 55 percentage of respondents used for writing essays or assignments and 40 percentage of respondents used AI virtual assistants for answering academic questions.
- 8 percentage of respondents used AI virtual assistants very rarely, 58 percentage of respondents have moderate usage, 27 percentage of respondents have high usage and only 7 percentage of respondents have very high usage.

- 27 percentage of respondents opined that there is only a slight improvement in study performance, 40 percentage of respondents opined that there is moderate improvement, 31 percentage of respondents opined that there is high improvement, 2 percentage of respondents opined that there is very high improvement and none of them have no improvement.
- 8 percentage of respondents said that AI virtual assistants will replace traditional learning methods completely, 62 percentage of respondents opined that it will replace it partially, 23 percentage of respondents are not sure about it and 7 percentage of respondents said that traditional learning methods will not be replaced by using AI virtual assistants.
- 7 percentage of respondents said that AI virtual assistants will provide inaccurate information very often, 20 percentage of respondents said that it will provide inaccurate information often, 61 percentage of respondents said that sometimes it will provide inaccurate information, 12 percentage of respondents said that it may happens rarely and none of them said that it may never happens.
- 28 percentage of respondents said that AI virtual assistants will significantly affect the originality or critical thinking, 33 percentage of respondents said that it will affect some extent, 37 percentage of respondents said that it will affect neutrally and only 2 percentage of respondents said that it not at all affects.
- 23 percentage of respondents said that AI virtual assistants need the improvement in the case of accuracy of information, 18 percentage of respondents said that it need the improvement in understanding academic context, 22 percentage of respondents said that it needs improvement in providing references, 7 percentage of respondents said that it need improvement in language comprehension and 30 percentage of respondents said that it needs improvement in privacy protection.
- The respondents are highly satisfied with the ease of use of AI virtual assistants with a mean score of 4.20, followed by accuracy and usefulness of academic information with a mean score of 3.87. They are also satisfied with the ability to understand difficult topics with a mean score of 3.73, followed by the satisfaction regarding overall performance of AI virtual assistants with a mean score of 3.72. They are satisfied with the efficient completion of assignments with a mean score of 3.67, followed by recommending it to others with a mean score of 3.62. They are least satisfied with the overall improvement in learning experience due to AI virtual assistants with a mean score of 3.53.
- The major factor influencing students usage of AI virtual assistants in study habits is ease of use and accessibility. The second factor is accuracy and speed of responses. The third factor is helpfulness in completing assignments. The fourth factor is curiosity or interest in technology and the least factor influencing students usage of AI virtual assistants is recommendations from peers or teachers.
- The main challenge faced while using AI virtual assistants is inaccurate or irrelevant answers. The second challenge is overdependence on AI tools. The third challenge is difficulty using commands or features. The fourth challenge is poor internet connection and the least challenge is privacy or data security concerns.
- The calculated value (0.1520) is lesser than the table value (21.026), so we accept the null hypothesis (H0). So there is no relationship between Age and Improvement in Study Performance.
- The calculated value (0.2089) is lesser than the table value (9.488), so we accept the null hypothesis (H0). So there is no relationship between Gender and Improvement in Study Performance.
- The calculated value (0.2881) is lesser than the table value (31.410), so we accept the null hypothesis (H0). So there is no relationship between Course/Program and Improvement in Study Performance.
- The calculated value (1.0136) is lesser than the table value (26.296), so we accept the null hypothesis (H0). So there is no relationship between Frequency/Usage and Improvement in Study Performance.

Suggestions

- In order to improvise the privacy protection in AI virtual assistants, it should collect and store only minimal and essential student data, and students must be given full control to access, manage, or delete their personal information to ensure privacy protection.
- Personalized study support by AI virtual assistants should be offered to students through the analysis of their study trends and offering tailor-made study schedules, explanations and practice sets to enhance study performance.
- The likelihood of providing unrelated and incorrect answers from AI virtual assistants can be overcome by constantly feeding the system with disciplinary and verified sources and also incorporating user feedback for improvement.
- Excessive reliance on AI virtual assistants can be tackled by encouraging use of the virtual assistants as learning support that helps develop critical thinking and problem solving skills rather than providing direct answers.

Conclusion

The research titled "Investigating Impact of AI Virtual Assistants on the Study Habits of The College Students: A Case Study of Thrissur District" revealed that AI virtual assistants are highly effective in improving the study behaviour of college students as it offers personalised learning, instant academic help, effective time management and improved preparation for examination. They enhance their study habits, reduce their stress and encourage them to learn on their own. Students have medium knowledge about AI virtual assistants and they are using it 2-3 times in a week which in turn means that they are interacting with it every day. They believe that AI virtual assistants somewhat will replace the learning process and to a certain extent it will influence on creativity or critical thinking. Students are very satisfied with the satisfaction level of AI virtual assistants ease of use and its effectiveness. But issues like personal privacy, misinformation, and addictive habit need to be tackled with these virtual assistants through ethical use, right guidance and responsible development. AI virtual assistants as complementary to traditional teaching methodologies, if used prudently, will help college students in their learning journey immensely, which will eventually impact their academic performance.

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