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Assessing the Determinants of Generative AI Integration: A Study on Google's Gemini Adoption Among Thai University Students

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Abstract

The advent of Generative Artificial Intelligence (AI) in educational tools like Gemini represents a significant evolution. These technologies aim to revolutionise learning by creating human-like content in various formats, enhancing personalised and engaging educational experiences. This research investigates the factors influencing Thai graduate students' adoption of Gemini, employing a quantitative approach with data from 826 respondents via closed-ended questionnaires through convenience sampling. The analysis included demographic, socio-economic, and media platform preference variables. Using binary logistic regression, the study evaluated how these factors affect graduate students' intentions to use Gemini in Thailand. Key determinants identified include age, education level, occupational status, and preferences for social media platforms like Facebook and YouTube. The study provides insights into the factors influencing Thai graduate students' use of Gemini, useful for stakeholders in digital literacy and technology adoption. It stresses the importance of tailoring digital environments to learners' diverse needs, influenced by demographics and social media, and offers strategies for enhancing digital literacy and engagement. The research also sets the stage for further academic inquiry into educational technology, advocating for an interdisciplinary approach to better understand technology's educational impact.

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Introduction

Digital technology has become a crucial factor in the realm of education. Digital tools in educational contexts offer tailored learning pathways, foster collaborative endeavours among students, and provide access to extensive informational resources. Digital innovation affords personalised learning experiences, bolsters collaboration and communication, and access to vast amounts of information. Moreover, digital technologies serve to reconcile traditional classroom instruction with real-world scenarios, equipping students for forthcoming careers in sectors dominated by technology. Consequently, proficiency in technological utilisation emerges as a critical requirement for educators and students alike in this digital age (Alam & Mohanty, 2023; Kasmia & M'hamed, 2023; Timotheou et al., 2023).

In contemporary society, the integration of AI and automation has become a tangible reality, permeating various aspects of daily life with a well-documented growth trajectory (Kessler, 2018; West, 2019). Generative AI, a notable subset capable of producing diverse content, stands out in this landscape. The education sector, in particular, has been significantly impacted by this technological revolution (García-Peñalvo et al., 2023; Samala et al., 2024). Unlike traditional AI models that predominantly engage in pattern recognition and predictive analytics, Generative AI employs machine learning to create data reflective of its training material, showcasing remarkable versatility in content creation across identical or disparate media formats (Bell et al., 2023). Moreover, advancements in Natural Language Processing (NLP) have facilitated the development of sophisticated Large Language Models (LLMs), including but not limited to ChatGPT, Claude, and Gemini. These entities have significantly impacted various fields through their exceptional capabilities in text generation, machine translation, and code synthesis, indicating a notable shift in how digital systems interface with human linguistic constructs (Khademi, 2023; Teubner et al., 2023). ChatGPT, developed by OpenAI, is an advanced language model widely used in education for tutoring, writing support, and research assistance. It automates responses to student questions and aids educators in creating content, improving the efficiency of educational interactions (Chinonso et al., 2023; Ismail et al., 2023; Yu, 2024). Similarly, Claude, developed by Anthropic AI, serves as both an AI chatbot and the underlying LLM, excelling in tasks such as summarization, editing, decision-making, and code-writing (Cuadrado et al., 2024; Proudfoot, 2024). Initially known as Bard, Gemini leverages real-time data from Google Search to provide updated answers and information. In educational settings, Gemini assists in creating learning materials enriched with the latest data, serving as both a tutor and a research tool for students, helping them access current information for their studies (Ananda, 2024; Imran & Almusharraf, 2024).

The emergence of Generative AI in tools like Gemini signifies a leap forward, particularly in education, where these technologies promise to transform learning experiences by producing new, human-like content across various formats (Perera & Lankathilake, 2023). Given the significant position Gemini holds as a novel and indispensable AI technology, its comprehensive evaluation is imperative. The choice of Gemini over other AI tools, like ChatGPT, for this study was driven by its specific relevance and rising prominence within the Thai educational sector during the research period. Targeted marketing efforts by Google and Gemini's notable

integration with other Google services commonly used in education significantly influenced this focus. Moreover, the concurrent timing of Gemini's market introduction and the onset of the study presented a unique opportunity to observe and analyse the adoption trajectories of this new technology within the educational sector. While the inclusion of ChatGPT could potentially have provided a richer comparative analysis of generative AI tools, the specific focus of this study was to explore the utility and impact of Gemini. Specifically, this study investigated the factors influencing the adoption of Gemini among Thai graduate students, focusing on demographic, socio-economic, and behavioural attributes to inform global knowledge about Google Gemini for higher education.

Research question

What key factors influence Thai graduate students' adoption of Gemini?

Literature

Artificial Intelligence (AI) in education

AI epitomises the computational instantiation of human-like cognitive functions within machine or computer systems (Asensio et al., 2014; Petrović, 2018). These functionalities endow AI systems with the ability to simulate and emulate human behaviours, facilitating machines to perceive, comprehend, strategize, execute actions, and accumulate knowledge in a manner akin to human intelligence. The multifaceted capabilities of AI encompass a spectrum of tasks including environmental perception, object identification, participation in decision-making processes, adept handling of complex problem-solving scenarios, assimilation of knowledge from past experiences, and replication of discernible patterns (Funda, 2023; Shandilya et al., 2024). These proficiencies converge to enable the execution of diverse tasks, ranging from autonomous driving to facial recognition for device authentication. Within the realm of AI, a broad spectrum of technologies exists, including but not limited to machine learning, natural language processing, computer vision, and various others. These cutting-edge technological paradigms empower computer systems to comprehend and interpret human language, extract insights from empirical data, and formulate anticipatory predictions (Mukhamediev et al., 2022; Huawei Technologies Co., Ltd., 2023; Sheikh et al., 2023).

AI and large-language model chatbots have garnered significant attention in higher education and research practice (Crawford et al., 2023). The increasing adoption of AI technology in educational institutions is enhancing students' learning experiences by offering tailored learning experiences, adaptive feedback, and improved classroom management. Notable applications include AI-facilitated chatbots that assist with assignments, provide immediate clarifications, and deliver prompt feedback. AI algorithms also analyse student data to identify academic challenges and suggest personalised resources or interventions. Additionally, AI aids educators in grading, curriculum design, and administrative tasks, allowing more time for direct teaching and student support. By leveraging AI, educational institutions can create a more individualised and effective learning environment, promoting students' optimal development (Chassignol et al., 2018; Chiu & Chai, 2020; Kuleto et al., 2021).

Gemini

Launched in May 2023, Google's Bard AI (now known as Gemini) is an innovative AI chatbot developed by Google, designed to understand and respond to a wide variety of questions with near-human accuracy. It stands out from similar text-generation AIs like ChatGPT due to its integration with Google Search, providing real-time internet data access. Based on the advanced Pathways Language Model (PaLM 2) and trained on a diverse dataset, Bard AI is equipped for tasks including text generation, language translation, and the creation of various types of content, making it invaluable for tasks requiring current knowledge or quick information access (Rudolph et al., 2023; Siad, 2023). Subsequently, Pichai and Hassabis (2023), alongside Hsiao (2024), report that Alphabet Inc.'s Google has embarked on a significant rebranding effort for its Bard AI chatbot, now rebranded as Gemini. This rebranding initiative includes the launch of a dedicated mobile app and the introduction of a subscription model for an enhanced version of the platform. Such strategic adjustments aim to improve Google's standing in competition with key market players. The rebranded Gemini, named after Google's advanced AI model series that underpins the tool, is now available in more than 40 languages. The introduction of a mobile app, supporting both Android and iOS systems, was announced on a recent Thursday. Additionally, Google has introduced Gemini Advanced under a subscription model, which is part of Google's Google One AI Premium Plan, currently priced at $19.99 per month. In line with these changes, Duet AI is set to be integrated into Gemini for Workspace and Google Cloud, broadening the tool's application across various Google services such as Gmail, Docs, and Sheets. This strategic move is aimed at bolstering Google's position in the competitive landscape, particularly against the premium offerings of OpenAI's ChatGPT and Microsoft's Copilot, and at repositioning Gemini in the market by addressing and moving beyond the initial critiques of Bard's functionality (Dogra, 2024; Pichai, 2024; Steinschaden, 2024).

Demographic factors

Demographic factors are pivotal in analysing individual characteristics, serving as the foundation for developing effective strategies. These elements profoundly shape individual behaviour and are widely utilised due to their measurable and distinct nature (Ali & Zubairi, 2020; Gajanova et al., 2019). In education research, several key demographic factors significantly influence educational outcomes and experiences. Gender plays a crucial role, with studies examining disparities in subject preferences, academic performance, and career choices. For instance, despite progress, gender gaps persist in STEM fields at higher education levels (Reinking & Martin, 2018). Age is another critical factor, not only in terms of developmental stages in primary and secondary education but also in the context of lifelong learning and adult education (Knowles et al., 2020). The education level of individuals, often closely linked to that of their parents, can predict academic achievement and future educational attainment (Davis-Kean, 2005). Occupation, both of students (in the case of adult learners) and of parents, influences educational aspirations, access to resources, and career trajectories. Research shows that parents' occupations often determine the socio-economic background, which directly impacts the resources available for their children's education, as well as shaping the aspirations children form regarding their future careers (Kurlaender & Hibel, 2018; Duta et al., 2021; Schörner & Bittmann,

2023). Income, often intertwined with occupation and education, is a powerful predictor of educational outcomes, affecting everything from early childhood education opportunities to college accessibility (Sirin, 2005).

Social media platform usage

The influence of social media on an individual's propensity towards technological utilisation is both profound and intricate. Primarily, it serves to augment digital literacy by fostering frequent engagement across diverse platforms, thereby bolstering confidence and proficiency in navigating the digital landscape. Consequently, individuals often exhibit a heightened receptivity towards exploring and integrating novel technologies into their lives. Furthermore, social media functions as a potent conduit for the dissemination of perceived utility, elucidating the advantages of various technologies through interpersonal exchanges and promotional endeavours. The phenomenon of network effects exacerbates this influence, as the burgeoning user base of a platform renders its presence increasingly indispensable, thereby nurturing an environment conducive to technological assimilation. Moreover, the behavioural reinforcement mechanisms inherent in social media, manifested through actions such as likes, comments, and shares, not only incentivize continued engagement with these platforms but also engender a constructive feedback loop conducive to the adoption of additional technological tools. This propensity is further accentuated by the pervasive phenomenon of FOMO (Fear of Missing Out), compelling individuals to remain connected and abreast of developments through contemporary technological modalities. (Abbas et al., 2019; Fraccastoro et al., 2021; Tandon et al., 2021; Vahdat et al., 2021). In short, the role of social media in shaping technological adoption behaviours is also significant. Factors such as positive user reviews, peer recommendations, educational content, and social media marketing campaigns can increase the likelihood of adopting new technologies. In contrast, negative experiences or security issues shared on these platforms may deter potential adopters. This highlights the crucial role of social media as an intermediary in the technology acceptance process (Qalati et al., 2021; Amegbe et al., 2023).

Method

This research, utilising a quantitative methodology, explored the factors influencing Thai graduate students' intentions to employ Gemini within the Thai context.

Questionnaire development and administration

The development and administration of the questionnaire were meticulously executed to ensure the study's integrity and relevance in examining individuals' intentions to use Gemini in Thailand. The questionnaire included demographic and socio-economic questions (gender, age, education, occupation, income) as well as behavioural aspects (preferred media platforms: Facebook, X, Line, YouTube, Instagram). Initially, the items were crafted based on established research to align with validated concepts and theories relevant to the study's goals. A pre-test with 30 individuals refined the tool by identifying and correcting ambiguous or misleading items. Additionally, three

experts in education management and social science reviewed the questionnaire to validate its relevance and appropriateness for the study's objectives.

Ethics statements

The research underwent a rigorous review and received formal approval from the Ethics Review Board of Rangsit University, under Certificate of Approval number RSUERB2023-105. The board carefully evaluated the research methodologies and ethical considerations to ensure compliance with academic standards and ethical norms. Participants were provided with a detailed outline of the research objectives to ensure informed consent, and only individuals aged 18 or older were included to guarantee appropriate consent and maturity. Participants were also informed of their right to withdraw from the study at any time without consequence. To maintain data integrity and reliability, only fully completed questionnaires were included in the final analysis. These measures were implemented to protect participant rights, ensure data quality, and uphold the research's overall integrity.

Sample selection

The study's sample selection was carefully designed to accurately represent Thai nationals who are university graduate students, aged 18 and above, residing in Thailand, and familiar with Gemini. To ensure data accuracy, stringent exclusion criteria were applied, including only current graduate students. This approach ensured the participant pool reflected the intended demographic, enhancing the study's relevance and validity. Cochran's formula was used to determine the minimum sample size, set at 384 subjects with a precision level of 0.05 and a 95% confidence interval. To address potential data attrition and enhance validity, the sample size was expanded to 826 participants. Convenience sampling was employed to collect extensive data from diverse respondents meeting the criteria.

Data collection

The data collection phase was meticulously conducted online via LINE and Facebook Messenger, chosen for their popularity and widespread use among the Thai population (Chayomchai et al., 2022; Schneider & Harknett, 2022). This approach ensured effective engagement with the target demographic. The survey, designed for mobile compatibility, was distributed from December 2023 to February 2024 to enhance accessibility and encourage responses. Leveraging the extensive networks of LINE and Facebook Messenger optimised participant engagement and response rates. The three-month collection period was crucial for gathering comprehensive data on individual behaviours and preferences, ensuring the findings accurately reflected current trends and the evolving role of AI tools in education.

Data analysis

In the data analysis phase, a combination of descriptive and inferential statistical methods was applied through the use of advanced statistical software, facilitating an in-depth investigation of the study variables and their interrelationships. The employment of logistic regression as the analytical technique was predicated on its suitability for examining the relationships between several independent variables—including demographic characteristics, socioeconomic status, and behavioural factors—and a binary dependent variable, in this case, the intention to use

Gemini. This analytical model is particularly effective for predicting the likelihood of binary outcomes as a function of various predictor variables. The predictive regression equation using the coefficients can be described by the following equation:

$$P = \frac{1}{1+e^{-z}}$$

Where P is the probability of the dependent event occurring
e is the base of the natural logarithm
z is the linear combination of the independent variables and their respective coefficients, expressed as $\beta_0 + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_nX_n$ where β_0 is the intercept, $\beta_1, \beta_2 \ldots \beta_n$ are the coefficients, and $X_1, X_2 \ldots X_n$ are the independent variables.

Prior to the application of logistic regression, a series of preliminary tests were performed to ensure that the dataset conformed to the requisite assumptions of the method, thereby affirming the reliability and validity of the analytical outcomes. These preparatory steps included evaluating the dataset for multicollinearity among the independent variables to prevent skewed or misleading effects due to highly correlated predictors. Additionally, the assumption of linearity in the log odds was checked, confirming that the relationship between the log odds of the dependent variable and each independent variable is linear. These preparatory measures were indispensable for augmenting the precision and interpretability of the logistic regression analysis. By validating these assumptions, the study was positioned to yield meaningful insights into the determinants influencing the likelihood of adopting Gemini, thereby offering valuable contributions to the understanding of digital tool usage within the educational domain.

Results

A dataset was compiled from 826 Thai graduate students familiar with Gemini, who voluntarily completed online questionnaires. After data collection, a meticulous process of coding and analysis was conducted to ensure the accuracy and suitability of the data for statistical examination. This rigorous approach ensured that the dataset was properly prepared and analysed, providing a thorough understanding of the factors influencing Gemini adoption.

All variables into the model

Table 1:
Omnibus test of the model's performance using all variables

		Chi-square	df	Sig.
Step 1	Step	84.549	10	.000
	Block	84.549	10	.000

	Model	84.549	10	.000

Table 1 presents that chi-square is 84.549, with df equal to 10. Therefore, a dependent variable can be explained by all independent variables at the significance level of 0.05. This indicates that the model significantly predicts the dependent variable, suggesting that the independent variables collectively have a meaningful impact on the intention to use Gemini among Thai graduate students. The result confirms that these variables together significantly influence the outcome, rejecting the null hypothesis that they have no effect.

Table 2:
The model summary using all variables

Step	-2 log likelihood	Cox & Snell R square	Nagelkerke R square
1	1057.967[a]	.097	.130

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

Table 2 provides a model summary, indicating the proportion of variance in the dependent variable explained by the independent variables. The Cox & Snell R squared is 0.097, and the Nagelkerke R squared is 0.130, suggesting that the model accounts for approximately 13.0% of the variance in the intention to use Gemini.

Table 3:
Classification table for back-testing using all variables

Observed			Predicted		
			Gemini		Percentage correct
			No	Yes	
Step 1	Gemini	No	317	119	72.7%
		Yes	181	209	53.6%
	Overall percentage				63.7%

Note: The cut-off value is .500.

Table 3 shows the model's predictive accuracy for the intention to use Gemini among Thai students. It displays how well the model classifies actual outcomes based on a cutoff value of 0.500. The table indicates that 72.7% of the "No" predictions and 53.6% of the "Yes" predictions are correct, leading to an overall predictive accuracy of 63.7%. This suggests that the model is

moderately effective in distinguishing between users who are likely and unlikely to adopt Gemini, with a stronger performance in predicting non-adopters than adopters.

Table 4:
Variables in the model using all variables

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Gender	-.107	.150	.511	1	.475	.899
	Age	-.135	.043	10.120	1	.001	.873
	Education	.304	.067	20.550	1	.000	1.355
	Occupation	-.128	.047	7.495	1	.006	.880
	Income	.003	.070	.002	1	.960	1.004
	Facebook	-.649	.194	11.186	1	.001	.523
	X	-.044	.187	.056	1	.814	.957
	Line	-.215	.213	1.024	1	.312	.806
	Youtube	.836	.210	15.777	1	.000	2.307
	Instagram	-.057	.204	.077	1	.782	.945
	Constant	-.648	.529	1.500	1	.221	.523

a. Variable(s) entered in step 1: gender, age, education, occupation, income, Facebook, X, Line, Youtube, Instagram

The predictive regression equation of Model 1 using the coefficients from Table 4 can be described by the following equation:

$$P = \frac{1}{1+e^{-z}} \quad \text{---------- Model 1}$$

where P is the intention to use Gemini in Thailand, and Z = – 0.648 – 0.107(age) + 0.304(education) – 0.128(occupation) – 0.649(Facebook) + 0.836(Youtube).

Table 4 presents the significance level of each independent variable in relation to the dependent variable, which is the intention to use Gemini in Thailand. The analysis indicates that age, education, occupation, Facebook, and YouTube significantly describe the intention to use Gemini. Conversely, gender, income, X, Line, and Instagram were not significant predictors. Specifically, an increase of one unit in age results in a decrease in the intention to use Gemini, with the likelihood dropping to 0.873, indicating a decrease of 0.127 (1 - 0.873 = 0.127), implying that older individuals may be less inclined to adopt new technology. An increase of one unit in education leads to an increase of 1.355 in the intention to use Gemini, implying that more educated individuals are more receptive to technological innovations. For occupation, a one-unit increase results in a decrease in intention to use Gemini to 0.880, reflecting a decrease of 0.120 (1 - 0.880 = 0.120), implying that certain occupational roles may be less inclined towards adopting new technologies. Furthermore, using Facebook reduces the likelihood of using Gemini by 0.477 (1 - 0.523 = 0.477), indicating a possible preference for established platforms over newer technologies such as Gemini. In contrast, using YouTube increases the intention to use Gemini by 2.307 times, indicating a strong positive influence. This significant increase could be attributed to the alignment of YouTube's content consumption and creation dynamics with the functionalities provided by Gemini, which appealed particularly to users involved in these activities. These results underscore the complexity of factors that influence technology adoption, highlighting how demographic traits and media consumption patterns play critical roles in shaping user behaviour towards new digital tools like Gemini.

Only significant variables into the model

Table 5:
Omnibus test of the model's performance using only significant variables

		Chi-square	df	Sig.
Step 1	Step	83.108	5	.000
	Block	83.108	5	.000
	Model	83.108	5	.000

Table 5 presents that chi-square is 83.108, with df equal to 5. Therefore, a dependent variable can be explained by all independent variables at the significance level of 0.05. This statistical outcome suggests that the model, incorporating these variables, significantly predicts the dependent variable. Essentially, the table confirms that the independent variables collectively have a meaningful impact on explaining the variation in the dependent variable, the intention to use Gemini among Thai university students. This indicates a robust model where the selected predictors are relevant and have substantial explanatory power.

Table 6:

The model summary using only significant variables

Step	-2 log likelihood	Cox & Snell R square	Nagelkerke R square
1	1059.409[a]	.096	.128

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

Table 6 presents a summary of the logistic regression model using only significant independent variables. It includes the -2 log likelihood, Cox & Snell R square, and Nagelkerke R square values. The -2 log likelihood is 1059.409, indicating the fit of the model; lower values generally signify a better fit. The Cox & Snell R square is 0.096 and the Nagelkerke R square is 0.128, suggesting that the model explains approximately 12.8% of the variance in the dependent variable, which is the intention to use Gemini.

Table 7:
Classification table for back-testing using only significant variables

Observed			Predicted		
			Gemini		Percentage correct
			No	Yes	
Step 1	Gemini	No	306	130	70.2%
		Yes	175	215	55.1%
	Overall percentage				63.1%

Note: The cut-off value is .500.

According to Table 7, the classification indicates that the model with all the independent variables was able to predict the intention to use Gemini in Thailand with an accuracy rate of 63.1% of cases when there was a cut-off value of 0.500 or 50%. This indicates that the model is moderately effective in distinguishing between users likely and unlikely to adopt Gemini based on the predefined variables.

Table 8:
Variables in the model using only significant variables

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age	-.132	.041	10.417	1	.001	.876

	Education	.300	.066	20.860	1	.000	1.349
	Occupation	-.130	.046	7.862	1	.005	.878
	Facebook	-.677	.182	13.777	1	.000	.508
	Youtube	.768	.170	20.411	1	.000	2.156
	Constant	-.880	.442	3.960	1	.047	.415

a. Variable(s) entered in step 1: age, education, occupation, Facebook, Youtube

The predictive regression equation of Model 2 using the coefficients from Table 8 can be described by the following equation:

$$P = \frac{1}{1+e^{-z}} \quad \text{---------- Model 2}$$

where P is the intention to use Gemini in Thailand, and Z = – 0.880 – 0.132(age) + 0.300(education) – 0.130(occupation) – 0.677(Facebook) + 0.768(Youtube).

Table 8 presents the significance level of each independent variable in relation to the dependent variable, which is the intention to use Gemini in Thailand. The analysis reveals that age, education, occupation, Facebook, and YouTube significantly influence the intention to use Gemini. Specifically, an increase of one unit in age results in a decrease in the intention to use Gemini, with the likelihood dropping to 0.876, indicating a decrease of 0.124 (1 - 0.876 = 0.124). This suggests a higher propensity for younger individuals to adopt this technology. An increase of one unit in education leads to an increase in the intention to use Gemini by 1.349, suggesting that higher education levels positively influence this intention. For occupation, a one-unit increase results in a decrease in the intention to use Gemini to 0.878, reflecting a decrease of 0.122 (1 - 0.878 = 0.122), possibly reflecting varied technological needs and exposures across different occupational roles. Additionally, the use of Facebook is associated with a significant decrease in the intention to use Gemini, reducing the likelihood to 0.508, a decrease of 0.492 (1 - 0.508 = 0.492), indicating a possible preference for established platforms over newer technologies like Gemini. In contrast, the use of YouTube significantly increases the intention to use Gemini by a factor of 2.156, indicating a strong positive influence. This substantial increase could be attributed to the alignment of YouTube's content consumption and creation dynamics with the functionalities offered by Gemini, appealing particularly to users engaged in these activities. These results collectively underscore the complex interplay of demographic characteristics and platform engagement in shaping technology adoption behaviours, providing valuable insights into the factors that drive the uptake of emerging technologies like Gemini among different segments of the Thai population.

Discussion

This research investigated the factors influencing the utilisation of Gemini among Thai graduate students. The propensity to adopt Gemini within this demographic was analysed based on variables including age, education level, occupational status, and the usage patterns of social media platforms such as Facebook and YouTube.

The results indicate a higher propensity for younger individuals to adopt Gemini, suggesting that younger cohorts are more likely to integrate the tool into their studies or research. This aligns with general trends in technology adoption, where younger generations are often early adopters of new technologies (Prensky, 2001). Wang et al. (2013) found that younger individuals are more adept at adopting new technologies due to their digital upbringing, which fosters curiosity and reliance on online platforms for various needs. Similarly, Thai et al. (2023) reported that children and youths hold positive views of AI, expressing interest in AI research and advocating for shared decision-making with AI. McDonald et al. (2023) demonstrated that Generation Z, having grown up with AI, is more likely to integrate AI tools into their studies and research.

This study found that education level influences engagement with digital platforms in graduate education. The positive correlation between education level and the intention to use Gemini suggests that as students advance, they may be more inclined to adopt sophisticated AI tools. This trend likely stems from the greater specialisation in advanced graduate education, which often requires complex technological tools like Gemini, offering services from basic search to advanced applications. Additionally, more advanced stages of graduate education may involve tasks that align with the capabilities of AI tools, supporting Weller's (2011) findings on the growing integration of technology in advanced academic work. Imran and Almusharraf (2024) further highlight Gemini as a versatile AI tool with potential for advanced educational applications, aligning with this trend toward specialised technological tools in graduate studies.

This study found that the impact of occupation on the intention to use digital platforms like Google's Gemini varies significantly among graduate students, depending on their field of study and work experiences. For example, students in tech-intensive fields like computer science or data analytics may view platforms like Gemini as essential to their academic work and future careers. This highlights the diversity within the graduate student population and their varying relationships with technology. The findings suggest that work experience influences the likelihood of adopting AI tools, with those from technology-driven sectors being more inclined to integrate tools like Gemini into their studies, aligning with Teo's (2009) research on the relationship between work experience and academic technology adoption.

This study found that Facebook usage among graduate students in Thailand significantly decreases their intention to use Gemini. This finding aligns with Manca and Ranieri's (2016) research on the complex relationship between social media use and technology adoption in higher education. Graduate students active on Facebook may be particularly sensitive to data privacy and security issues, given their advanced academic pursuits and the platform's dual role in personal and professional networking. This heightened awareness is consistent with studies on

privacy concerns among graduate students in digital environments, as noted by Veletsianos and Kimmons (2013). Their cautious approach could explain the reduced intention to use Gemini, as they may prefer to limit exposure to potential online vulnerabilities by sticking to platforms they perceive as more secure or are already familiar with.

This study found that YouTube usage might complement the use of Gemini. As suggested by Burhanli and Bangir-Alpan (2021), along with Shoufan and Mohamed (2022), YouTube users may be more inclined to explore and integrate other digital platforms. Additionally, YouTube's community features could foster a sense of academic community among graduate students, leading to increased awareness and adoption of new educational technologies like Gemini.

In the context of education and learning, the propensity of graduate students in Thailand to engage with Gemini was found to be shaped by a myriad of factors that include demographic attributes such as age, educational background, and occupation, in addition to the patterns of engagement with other social media platforms such as Facebook and YouTube. Gaining an understanding of these influencing factors can provide critical insights into the behaviours and preferences of users, thus enabling the tailored development and marketing of digital platforms. This approach ensures that these platforms are more adept at addressing the unique needs and preferences of diverse user groups, thereby enhancing their educational and professional utility.

Conclusion

This study delved into the multifaceted factors that shape the adoption rates of Gemini among Thai graduate students. This demographic's inclination to employ Gemini was meticulously examined through an array of determinants such as age, education level, occupational status, and engagement with social media platforms including Facebook and YouTube. Age was considered as an indicator of digital native status and adaptability to technological innovations. Education level was analysed to understand its correlation with digital literacy and competency. Occupational status provided insights into the practical needs and professional environments that may foster or hinder the adoption of Gemini. Additionally, the study scrutinised social media usage patterns to assess the impact of digital socialisation on the acceptance and integration of new digital tools in personal and professional spheres. This comprehensive approach aimed to furnish a holistic understanding of the factors driving the utilisation of Gemini among Thai graduate students, offering valuable implications for directors, educators, policymakers, and other stakeholders, engaged in digital literacy, technology adoption initiatives, and beyond.

These insights have far-reaching implications for various stakeholders in the educational technology ecosystem. For policymakers and educators, the results emphasise the need for tailored approaches in introducing AI tools like Gemini, considering the diverse backgrounds and digital experiences of graduate students. Technology developers and marketers can leverage these findings to refine their strategies, addressing the specific needs and concerns of different user segments within the graduate student population. Ultimately, this research lays the groundwork for more focused and effective technology integration initiatives in higher education,

which may contribute to improving the educational experience and outcomes for graduate students in an increasingly AI-driven academic environment.

Despite its contributions, this research has limitations. The reliance on convenience sampling may compromise the generalizability of the findings. Future studies should employ more diverse sampling techniques, such as stratified or random sampling, to ensure broader demographic representation. Additionally, the study identified negative correlations between age and Gemini adoption intentions, as well as between occupation and adoption intentions, highlighting the need for qualitative research to explore these relationships further. Moreover, the divergent effects of Facebook and YouTube usage on adoption intentions suggest a need for more detailed analyses of platform-specific behaviours and content exposure.

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