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GRAMMARLY ADOPTION AMONG HIGHER-EDUCATION STUDENTS IN YOGYAKARTA: THE IMPACT OF ONLINE AD EXPOSURE AND REFERENCE GROUP WITH THE MEDIATING ROLE OF TRUST

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ABSTRACT

Education has experienced significant changes due to recent advances in information technology. These technological developments, such as Grammarly, are pivotal in enhancing language education, mainly benefiting English as a Second Language learners. This research's primary objective is to examine how online ad exposure and reference groups impact the adoption of Grammarly while considering the mediating role of trust. This research utilized a quantitative approach involving a survey among 120 higher-education students in Yogyakarta. The analysis technique used in this research is path analysis using the SmartPLS program. Based on hypothesis testing, online ad exposure and reference groups have a positive and significant impact on Grammarly adoption behavior, where trust takes the role of full mediation on the relationship between online ad exposure and adoption behavior. Meanwhile, trust takes the role of partial mediation on the relationship between reference groups and adoption behavior. Furthermore, the managerial implications researcher can suggest for Grammarly are to improve further the performance of the features offered, where improvements to the feedback provided by Grammarly should be more contextual and relevant.

INTRODUCTION

Over the past few decades, significant advancements in information technology have led to increased innovations that effectively enhance various aspects of our daily lives. Education is one of the aspects influenced by technological advancements, especially with the COVID-19 pandemic breaking out in 2020 (Panigrahi, 2020). Moreover, advancements in information technology like artificial intelligence, cloud computing, big data analysis, augmented reality, and virtual reality are already establishing their presence. Utilizing these advancements will revolutionize educational paradigms and redefine how students engage with and approach the learning process (Awalin et al., 2023). Incorporated artificial intelligence tools such as Grammarly have become a pivotal point in language education, presenting an innovative approach to improving language learning and writing abilities. Especially, those learning English as a Second Language (ESL) frequently encounter difficulties mastering intricate grammar and subtle stylistic elements (Alotaibi, 2023; Fitria, 2021). Grammarly is capable of examining and correcting grammar, punctuation, spelling, wordiness, usage, style, and detecting plagiarism. It also offers word recommendations to aid students in enhancing their writing (Oktaviani et al., 2022).

As an artificial intelligence-based writing assistant platform, Grammarly is considered helpful and widely used in many colleges and universities around the world (Vo & Nguyen, 2020). Previous research has explored the positive effects of Grammarly in enhancing students' grasp of grammar principles and boosting their self-assurance in writing (Ventayen & Orlanda-Ventayen, 2018). Previous studies have also revealed that Grammarly has had a noteworthy influence on the quality of students' writing, fostering precision in their writing and improvement of their English writing skills (Fadhilah et al., 2019; Ghufron, 2019). As an innovation, Grammarly has revolutionized how higher-education students learn by providing real-time grammar and writing assistance, empowering them to improve their writing skills and excel academically. Its user-friendly interface and comprehensive feedback make it an invaluable tool for students seeking to enhance their writing proficiency (Alotaibi, 2023; Armanda et al., 2022).

Grammarly's adoption among higher-education students is closely tied to its promotional efforts, especially online advertising campaigns across digital platforms (Ambarwati, 2021). These ads play a crucial role in the diffusion of innovation, spreading awareness and knowledge about Grammarly as the first stage of diffusion. However, the effectiveness of these ads varies based on factors like the product category, customer segment, and ad format (Liu-Thompkins, 2019). Furthermore, good advertisement should make the audience trust the product, Trust has a crucial role in online ads because the effectiveness of the ads will be significantly affected when consumers distrust online ads (Leong et al., 2020). Previous studies found that online ad exposure impacts trust and actual product use (Clemens et al., 2017; Nugroho et al., 2022; Purnama et al., 2019; Zheng et al., 2021). Other studies also found that source of information such as online ad exposure does not impact consumer trust or product usage (Piarna, 2014). Even in some cases, mass media exposure, including online media, may not always affect individual trust (Armaya et al., 2014).

Grammarly's utilization among higher-education students also cannot be separated from the role of early adopters who introduced this innovation to them. In the diffusion of innovation, early adopters are typically the second group to adopt an innovation, they are crucial in the diffusion process because they serve as opinion leaders and influencers within their social networks (Rogers, 2003). Early adopters such as lecturers or college friends are a form of reference group who can influence college students. Perceptions of reference groups influence individual trust in the information reference groups provide. Therefore, the reference group is a factor that can influence consumer purchasing decisions (Dewi et al., 2023). Previous studies found that reference groups impact trust and actual product use (Faidah & Harti, 2021; Rakhmawati & Sudarwanto, 2021; Sarah & Artanti, 2020). Other studies also found that reference groups do not impact consumer trust and product usage (Anggraini & Sanjaya, 2020; Kurniawan & Dwijayanti, 2022).

Both online ad exposure and reference groups are integral components of the communication channels, among the four crucial elements in the diffusion of innovation (Littlejohn et al., 2017). These two communication models can be categorized as a form of a two-step flow model of communication that can effectively influence an individual. The first step of the two-step theory of media influence is transmitting information to a mass audience, and the second step is validating the message by people the viewer respects (Griffin, 2012). Furthermore, Grammarly was created in response to the challenges of non-native English speakers or even the general public in achieving proficient grammar in their writing (Armanda et al., 2022; Marliyanda et al., 2022; Vo & Nguyen, 2020). This innovative solution has gained widespread adoption, particularly in the education sector. Grammarly has received numerous accolades, such as being recognized as one of the Most Innovative Companies by Fast Company and making Forbes' list of the top 100 Cloud Companies while also earning millions of active users (Lytvyn et al., 2023).

This research's primary objective is to examine how online ad exposure and reference groups impact the adoption of Grammarly while considering the mediating role of trust. In strategic communication principles, trust can be considered as a form of positive attitude that

determines the success of a program or campaign. In addition to utilizing trust as a mediating variable, this research introduces a more concentrated subject area as a novelty. This research also tries to validate the previously identified research gap. Furthermore, there is a hope that this investigation can serve as a valuable resource for assessing and gaining insights into strategic communication in the digital era, particularly in the context of spreading innovation.

LITERATURE AND METHODOLOGY

Diffusion of Innovation Theory

Diffusion of innovation is a media and communication theory that explains the process where an innovation is communicated through particular channels within a particular time among members of a social system (Littlejohn et al., 2017). Diffusion is also viewed as a form of social transformation, specifically as a process where the structure and operation of a social system change (Muntaha & Amin, 2023). An innovation is an idea, practice, or object perceived as new by an individual or group. The perception of something as new is subjective and relies on the perspective of the individual or group about the current state of the innovation (Rogers, 2003). There are four essential components to the diffusion of innovations theory that help determine how to enhance the rate and efficiency of innovation adoption: time, the innovation itself, communication channels, and social system (Littlejohn et al., 2017).

Furthermore, the adoption rate is determined by how people perceive the characteristics of the innovation, such as its relative advantages compared to existing choices, compatibility with their current values and experiences, the complexity of the innovation, trialability, and observability (Rogers, 2003). The more these perspectives to showcase the potential aspects of innovation characteristics, the more likely people will adopt the innovation (Littlejohn et al., 2017). An innovation must be practical and contain elements of comfort and convenience. The process of decision and implementation of the innovation cannot be separated from the characteristics of the innovation itself, and these characteristics play an essential role in

determining the speed of an innovation process (Agag & El-Masry, 2016)

Online Ad Exposure

An online ad is a form of promotion that uses the internet as an advertising medium, where advertising generally refers to all communication techniques used by marketers to reach consumers and convey their messages (Moriarty et al., 2014). Online ad exposure can be interpreted as a condition where a person is exposed to the content of an online advertisement or how the content of an existing online advertising hits the audience (Marta & Monica, 2017). Media exposure generally refers to the degree of audience involvement with online media-distributed messages or degree of interest and attention individuals or groups dedicate to these messages (Ardianto, 2014). The level of online ads users encounter while browsing the internet is directly linked to the volume of ads in circulation, considering that users often receive more than one advertisement from the same advertiser (Galan et al., 2019). Furthermore, online ad exposure can be measured using the general exposure model with several components including frequency, duration, and attention a person pays to an online ad (Febrida & Oktavianti, 2020; Rakhmat, 2003).

Reference Group

The reference group is a group that has an influence either directly or indirectly on an individual, and they are used as a reference in forming knowledge, attitudes, or behavior (Hoyer et al., 2016). Reference groups influence members in at least three ways, namely introducing new lifestyles and behaviors to someone, influencing self-concept and attitudes, and creating a sense of ease that could influence their decisions regarding product selection. (Kotler & Keller, 2021). Therefore, reference groups serve as a reference point for individuals regarding their consumption choices and buying decisions (Sarah & Artanti, 2020). This influence extends to most group members, implying that they rely on their group as a reference when making decisions (Kurniawan & Dwijayanti, 2022). A product or service purchased by someone can arise from the significant influence of reference groups such as family and close friends (Debora et al., 2014). Furthermore,

reference groups can be measured using group function components, including informational, utilitarian, and value expression (Peter & Olson, 2013; Rajanikanth, 2023).

Trust

Trust in marketing communications refers to consumers' collective understanding and assessments regarding the products, their attributes, and benefits (Mowen & Minor, 2001). Trust involves one party's reliance on another to fulfill their responsibilities in a transactional relationship, stemming from the belief that the trusted individual will meet their obligations as required (Wong, 2017). Building a better brand will be easier if trust is established well between customers and the company, where the relationship between the company and customers is reflected in the level of trust (Kasinem, 2020). Trust in the context of electronic transactions or e-trust can be defined as the credibility and benevolence of an e-commerce vendor that is perceived by consumers, where credibility is based on the consumer's belief in seller's competency to do the job effectively, while benevolence is referred to buyer's belief in the seller's positive intention (Ganguly et al., 2010). Furthermore, trust in the context of e-transactions can be measured using several components, including ability, benevolence, and integrity (Gefen & Straub, 2004; Novita & Wulandari, 2020)

Adoption Behavior

Adoption behavior is a stage in the innovation diffusion process where someone implements an innovation (Rogers, 2003). This implementation varies depending on the situation which can be influenced by needs, lifestyle, habits, income, or other factors (Sonjaya & Ruyani, 2023). During this implementation stage, the individuals determine the innovation's usefulness and can explore additional information regarding the innovation (Saputro et al., 2022). Adopting innovation involves a commitment to persist in its utilization. Individuals who have tried an innovation may continue to accept or no longer accept the innovation (Amali, 2019). When adopting the innovation for the first time (trial), consumers carry out an evaluation process. If the evaluation shows a positive attitude, they will continue the

adoption (Schiffman & Kanuk, 2004). From a marketing management point of view, consumers tend to continue to adopt when the innovation provides a sense of enjoyment and satisfaction (Sharma & Sharma, 2019). Furthermore, adoption behavior can be measured using actual use on technology acceptance model with several components including desire to use, always try to use, and continue to use (Murti et al., 2023; Pal & Triyason, 2018)

Hypothesis

Based on the introduction and literature review above, the two main hypotheses developed in this research are: (1) there is an impact of online ad exposure on Grammarly adoption behavior among higher-education students in Yogyakarta, which is mediated by trust, and (2) there is an impact of reference group on Grammarly adoption behavior among higher-education students in Yogyakarta which is mediated by trust.

Methodology

This research uses a quantitative method to measure variables, test hypotheses, and explain relationships between variables (Scharrer & Ramasubramanian, 2021). The variables tested in this research are online ad exposure (X1), reference group (X2), e-trust (Z) and adoption behavior (Y). The analysis technique used in this research is path analysis using the SmartPLS program. Path analysis is a development of regression statistics, which is used to test models of relationships between variables in the form of cause and effect (Olobatuyi, 2006). The primary data in this research was collected through a survey using a purposive sampling technique to 120 respondents who have used Grammarly and are currently perusing their studies in Yogyakarta. In partial least squares and structural equation models calculation, the sample size is considered sufficient if it is more than ten times the largest number of informative indicators in the model (Hair et al., 2017). Furthermore, the questionnaire measurement scale uses a Likert scale, with the following options: (1) strongly disagree, (2) disagree, (3) doubtful, (4) agree and (5) strongly agree. Meanwhile, the number of questions asked to respondents was 21 questions,

with the number of questions for each variable can be seen in table 1 below.

Table 1 Variable Indicators & Number of Questions

Variables	Indicators	Number of Questions
Online ad exposure	Frequency	2
	Duration	1
	Attention	2
Reference group	Informational	2
	Utilitarian	1
	Value expression	2
Trust	Ability	1
	Benevolence	2
	Integrity	2
Adoption behavior	Desire to use	2
	Always try to use	2
	Continue to use	2
Total		**21**

Source: Researcher, 2023

Hypothesis

Based on the introduction, literature review, and methodology above, the two main hypotheses developed in this research are: (1) there is an impact of online ad exposure on Grammarly adoption behavior among higher-education students in Yogyakarta, which is mediated by trust, and (2) there is an impact of reference group on Grammarly adoption behavior among higher-education students in Yogyakarta which is mediated by trust.

RESULTS AND DISCUSSION

Table 2 Respondent Data

Attribute	Category	Percentage
Sex	Male	45.0%
	Female	55.0%
Age	18-19	15.0%
	20-21	52.5%
	22-23	30.0%
	24-25	2.5%
University	UAD	27.5%
	UGM	20.0%
	UPNYK	20.0%
	UNY	15.0%
	UMY	10.0%
	Others	7.5%
Major	English Literature	38.3%
	English Language Education	26.7%
	Communication Science	16.6%
	Management	10.0%
	Others	8.4%
Duration of internet access per day	< 4 Hours	0.0%
	4-5 Hours	25.0%
	6-7 Hours	50.0%
	> 7 Hours	25.0%

Source: Primary data processing, 2023

Based on Table 2, it can be interpreted that most respondents are aged 20-21 years, or in other words, the majority of them are undergraduate students in their third or fourth years of college. Students mainly use Grammarly in the academic writing process because it is handy and practical (Faisal & Carabella, 2023). Meanwhile, most respondents are majoring in English literature. This department is one of the departments that use English in its teaching and learning activities, including writing. Furthermore, if we look at the respondents' internet access habits, most respondents spend 6-7 hours a day on the internet, this result is one level below the average internet access in Indonesia, which is seven hours and forty-two minutes per day (Simon, 2023). These internet access habits also indicate that most of the respondent is using the internet on their daily basis by spending one-sixth of their time a day connected to the internet.

Outer Model: Validity and Reliability Test
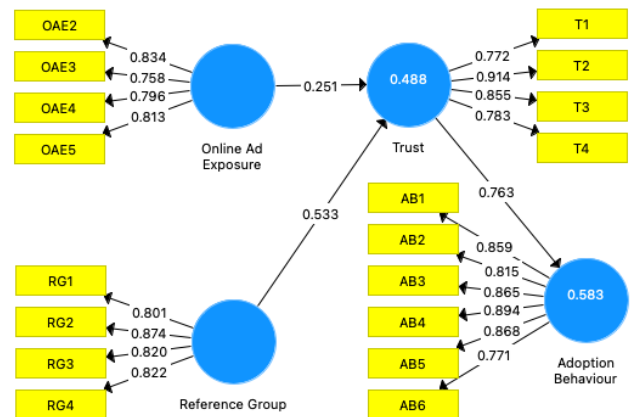
Picture 1 Outer Model PLS Algorithm

Data validity techniques in SmartPLS program can be done by examining the loading factor and average variance extracted (AVE) values on the outer model tested using the PLS Algorithm. The data is considered valid if the loading factor value is more than 0.70 and the AVE value is more than 0.5 (Ghozali, 2008). The loading factor value for each indicator in this study exceeded 0.70 after three invalid informative indicators were removed (picture 1), while the AVE value for the variables in this study also exceeded 0.50 (table 3). Meanwhile, the reliability test can be done by looking at the Cronbach's Alpha value which must be higher

than 0.60 (Ghozali, 2008), where in this study Cronbach's Alpha value for each variable has exceeded 0.60 (table 3)

Table 3 Validity & Reliability Test

Variable	AVE Value	Cronbach's Alpha
Online ad exposure	0.641	0.815
Reference group	0.688	0.849
Trust	0.693	0.850
Adoption behavior	0.716	0.920

Source: PLS Algorithm Output, 2023

Outer Model: Structural Model Test

The R-square value is used to show the extent to which the independent construct explains the dependent construct or shows the predictive power of the model. The rule of thumb used is 0.75, 0.50, and 0.25, indicating that the model is strong, moderate, and weak (Hair et al., 2017). Based on the outer model test (picture 1), the R-square value on adoption behavior is 0.583, or in other words, the model in this study is classified as moderate, and together the three independent variables and the existing mediating variables have a sufficient influence on Grammarly adoption behavior of 58.3%. The R-square calculation results also show that grammar adoption behavior is influenced by other variables outside this research model, with the remaining percentage being 41.7%. Furthermore, if calculated separately, online ad exposure and reference groups influence higher-education students' trust in Grammarly, which is 0.488 or 48.8%. The trust arising from online ad exposure and reference groups is classified as almost moderate because it is less than 0.2 points from 5.0.

Inner Model: Hypothesis Test
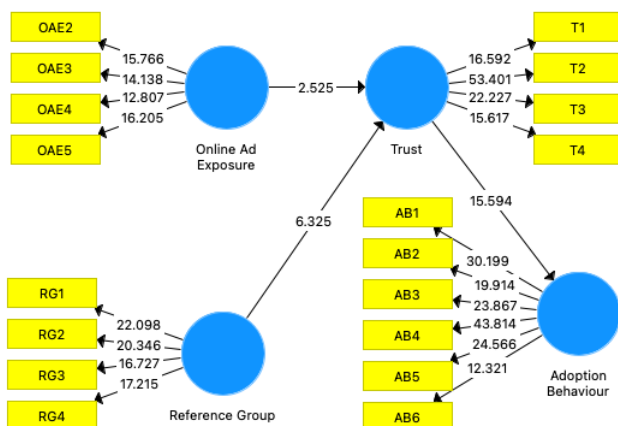
Picture 2 Inner Model PLS Bootstrapping

Inner model or hypothesis testing can be done using the bootstrap sampling method. Testing with the bootstrap technique in SmartPLS is also intended to minimize problems from interference with research data. In the PLS model, the sampling method that has been applied allows freely distributed data that does not require a normal distribution assumption (Ghozali, 2008). The statistical test used is the t-statistic parameter significance test, where the t-statistic value must exceed the t-table value of 120 samples, which amounts to 1.658.

Table 4 Path Coefficients

	O	M	Std. Err.	T-Stat.	P-Val.
Direct Effect					
OAE → T	0.251	0.264	0.099	2.525	0.012
RG → T	0.533	0.532	0.084	6.325	0.000
T → AB	0.763	0.766	0.049	15.594	0.000
Indirect Effect					
OAE → T → AB	0.192	0.203	0.077	2.480	0.013
RG → T → AB	0.407	0.409	0.076	5.371	0.000

Source: PLS Bootstraping Output, 2023

Based on Table 4 and Figure 2, both independent variables and moderating variable have a significant influence if we look at the resulting t-statistics exceeding the t-table number 1,658 and its p-value or significance level of less than 5 percent or 0.050 on both direct and indirect effects. In other words, the two main hypotheses developed in this research are accepted. Thus, it can be concluded that the model described is a good fit model with the accepted hypothesis based on the hypothesis testing criteria (Ghozali, 2008). Table 4 also explains that the independent variables have positive original sample values (O), which means that the higher online ad exposure and reference groups, the higher higher-education students trust in Grammarly. When the trust increases, Grammarly's adoption among higher-education students also increases.

Overall, the results of this study are in line with previous studies, which found that online ad exposure has an impact on trust and actual product use (Clemens et al., 2017; Nugroho et al., 2022; Purnama et al., 2019; Zheng et al., 2021) and reference group also has the same impact on trust and actual product use (Faidah & Harti, 2021; Rakhmawati & Sudarwanto, 2021; Sarah & Artanti, 2020). The results of this study also confirm that trust indeed

plays a mediating role in the impact of online ad exposure and reference groups on Grammarly adoption. Trust in innovation determines whether an innovation is accepted or rejected in the social system (Luo et al., 2010). It is a form of individual perception of relative advantage over existing options, the degree to which innovation is considered superior to the idea it supersedes. The higher the perceived relative advantage of the innovation, the faster it will be adopted by the social system (Rogers, 2003).

Furthermore, calculations need to be done using the Sobel formula to determine the nature of the existing mediating variables. The mediating variable is considered to be full mediation if the influence of the independent variable on the dependent variable becomes insignificant when controlled by the mediating variable, while the mediating variable is considered to be partial mediation if the influence of the independent variable on the dependent variable remains significant when controlled by the mediating variable (Ghozali, 2019). The Sobel Test calculation is done by entering the original sample and Std. The error between the direct effect and indirect effect on the path coefficient of the online ad exposure and reference group variables is controlled by the trust variable in the Online Sobel Test Calculator at http://quantpsy.org/sobel/sobel.htm (Preacher & Leonardelli, 2001)

Table 5 Sobel Test Calculation

Trust Control	Std. Err.	T-Stat.	P-Val.
OAE → AB	0.027	1.778	0.075
RG → AB	0.053	4.092	0.000

Source: Sobel Test Results, 2023

If we compare the t-table value of 1.658 with the t-statistics in Table 5 and look at the significance value of the existing Sobel test, it can be concluded that trust plays a full mediating role when controlling the influence of online ad exposure on adoption behavior. On the other hand, trust also plays a partial mediating role when controlling for the influence of reference groups on adoption behavior. These differences in mediation functions show that in a goodness fit model, mediation variables can have different roles depending on the influence value of the existing independent variables. Especially if we see that the influence of peer groups is partially much higher on trust than the influence brought by online ad exposure (picture 1). However, the extensive online ad exposure about Grammarly has provided much information, which information more favorable or trusted to a person's point of view will be evaluated more positively than the unfavorable or untrusted one (Rogers, 2003).

Exposure to Grammarly's online ad will provide individuals with knowledge regarding the innovations, or in this case, the features offered by Grammarly through their services. Today, the significant role of the internet and social media is vital for the diffusion of innovation (Littlejohn et al., 2017). On the other hand, Reference groups also play a significant role in forming beliefs that ultimately give rise to adoption behavior. In this case, the reference group is the lecturer and college friends. Their recommendations make individuals decide to adopt Grammarly. The pattern of interpersonal communication in this model is a highlight in the diffusion of innovation theory, where innovation will be much more accepted if spread through various channels, especially using the two-step flow model with a mass communication approach for a wider audience reach and interpersonal communication for changes in attitudes and behavior (Venus, 2019).

CONCLUSION

The research results and discussion provide the conclusion that (1) there is an influence of online ad exposure on Grammarly adoption behavior among higher-education students in Yogyakarta, which is fully mediated by trust, and (2) there is an influence of reference groups on Grammarly adoption behavior among higher-education students in Yogyakarta which is partially mediated by trust. Based on the research results and discussions, the managerial implication researchers can suggest for Grammarly is to improve further the performance of the offered features. Improvements on the feedback provided by Grammarly should be more contextual and relevant, so their integrity as an artificial intelligence-based writing assistant platform could be higher. Meanwhile, several things can be considered for further research, including exploring other variables such as innovation characteristics, sales promotion, user experience, or individual character. Also, identifying the

function of these variables and using SEM-AMOS to test the research hypothesis are highly recommended.

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