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Unveiling the Drivers of Mobile Learning App Adoption: A User-Centric TAM Investigation Based in Aizawl, Mizoram

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ABSTRACT

The proliferation of online learning platforms necessitates a comprehensive understanding of the factors influencing student adoption. This study investigates the determinants of college students' intention to utilize Coursera's educational application, employing the well-established Technology Acceptance Model (TAM). A quantitative approach was adopted, surveying 300 college students from Aizawl. The data collected through a meticulously designed questionnaire were analyzed using structural equation modeling (SEM). The psychometric analysis confirmed the instrument's validity and reliability. The findings reveal that perceived usefulness (PU) and perceived ease of use (PEOU) exert a significant positive influence on both attitude towards using (ATTU) and behavioral intention (BI). Students who perceive Coursera as valuable and user-friendly are more likely to adopt it and develop positive attitudes towards its use. Additionally, ATTU plays a crucial role in shaping BI, suggesting that favorable attitudes towards technology use contribute to students' intention to adopt Coursera. This research extends existing literature on the Technology Acceptance Model (TAM) by highlighting the importance of PU, PEOU, and ATTU as key factors in determining college students' intention to adopt Coursera's educational application. The results suggest that PU and PEOU directly impact students' behavioral intention, while also fostering a more positive attitude towards using the platform.

Keywords : Technology Acceptance Model (TAM), Coursera, Mobile Learning, Educational Applications

INTRODUCTION

Educational applications are platforms for educational content that cater to specific learning needs; theyintegrate management systems of learning with technologies. Advancement in the field of technology has had an immense impact on the education sector worldwide; it has led to the implementation of many policies to be integrated into the academic syllabus. Educational applications have been boosting the absorption of knowledge since its conception. Educational applications are software programs designed to facilitate learning and educational activities. They dispense a broad range of tools and resources to increase the learning experience for learners. They can be used on computers, tablets, and smartphones making learning more accessible and engaging. Popular educational applications include Duolingo for language learning, Khan Academy for academic subjects, and Coursera for online courses.

In today's digital era, educational applications are playing a pivotal role in transforming the way we learn. These apps leverage the power of technology to create engaging and interactive platforms for knowledge acquisition. As a result, they are reshaping traditional learning methods by offering personalized experiences tailored to individual learning styles and needs (Iqbal and Bhatti, 2015). In this discussion, we will delve into the importance of educational applications, their advantages, and their transformative impact on the field of education. While there is substantial research on educational

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applications, there is a gap in the research associated with the Technology Acceptance Model (TAM) concerning individuals' adoption of the Coursera application.

The Technology Acceptance Model (TAM), introduced by Davis in 1985, has become a widely recognized theory for understanding and predicting technological acceptance. TAM is founded on the Theory of Reasoned Action by Ajzen and Fishbein and seeks to explain user behavior in relation to technology adoption. The model posits that users' judgment on when and how to use technology is influenced by two main factors: perceived usefulness (PU) and perceived ease of use (PEOU). Studies have shown that both perceived usefulness and perceived ease of use have a positive impact on users' attitude towards technology use and their behavioral intention to adopt it (Mugo *et al.,* 2017). Furthermore, external variables can influence both perceived ease of use and perceived usefulness. Scholars have identified TAM as a reliable predictor of technology acceptance and utilization in educational settings and have applied the model to the development and implementation of mobile technologies for educational purposes (Bezuset *al.,* 2020). Moreover, research has indicated a strong correlation between students' perceived usefulness of mobile technologies and their willingness to use them for learning (Camilleri and Camilleri, 2019).

In the specific case of the Coursera mobile application, research seek to understand college students' attitudes and perceptions towards using Coursera to enhance their academic skills. This research aims to explore the adoption of the Coursera app among college students in the city of Aizawl and its impact on their knowledge enhancement.

Formulation of objectives and hypothesis:

The objectives of the researchare to bring about new knowledge as well as to construct a method for the study. The study's objectives are listed below:

1. To learn about the socio-demographics information of the respondents

2. To assess the acceptance and use of the educational application

Hypothesis are assumptions used to test a question which might end up true or false, from the extended review of literature, the research hypotheses implemented for the study were:

H1- PU has a positively significant effect on ATTU.

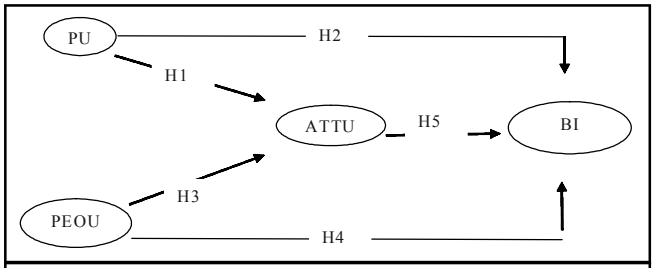

Fig. 1 : Technology Acceptance Model

H2-PU has a positively significant effect on BI to use a technology.

H3- PU has a positively significant effect on ATTU of technology.

H4- PEOU has a positively significant effect on BI to use a technology.

H5- ATTU of technology has a positively significant effect on BI to use a technology.

In addition to assessing the correlation between variables, it is crucial to utilize the survey results to determine the full extent of the causal parameters.

METHODOLOGY

The research conducted is a survey study that involved gathering information from a selected group of individuals through their responses to specific questions. The study focused on Aizawl, the capital city of Mizoram, India, and data collection took place from June 2022 to October 2022. Both primary and secondary data sources were consulted for this study. To select the sample, purposive sampling was used, specifically targeting Coursera users. The sample size was determined using the Yamane formula (1967) and resulted in 300 samples from a population of approximately 2000 college students. The study operated with a 95% confidence level and a 5.2% margin of error. To assess the adoption intention of the application, the research utilized the Technology Acceptance Model (TAM). A questionnaire was the primary research instrument, divided into two parts. The first part gathered socio-demographic information, such as gender, age, religion, marital status, reservation category, type of family, and socio-economic status. The second part was based on the TAM (Alrajawy *et al.,* 2018) and comprised 16 items related to perceived usefulness, perceived ease of use, attitude towards use, and behavioral intention.

RESULTS AND DISCUSSION

Table 1 shows male participants 51% exceeded female 49% by a small gap and the average age group of the participants were 18 to 20 years old. Christianity was the major religion of the participants with a total of 96% and 98% of the participants were not married yet. The majority of them that is 96% belonged to the Scheduled tribe and 54% of the participants were from a nuclear family. According to the "Modified BG Prasad Socioeconomic Status Scale-2022," most of the participants (66%) belonged to the lower middle class (III).

This specific composition invites further exploration and reflection. The slight male majority, especially within a context where women often face educational barriers, warrants investigation into potential factors attracting men to this educational avenue. The overwhelming Christian demographic raises questions about potential faith-based communities or networks influencing participation. The high proportion of unmarried participants, perhaps indicative of younger age, highlights the need to understand what draws this age group to this specific learning platform. The dominance of the Scheduled tribe and lower middle class further necessitates investigation into access and inclusivity within the program, exploring whether it effectively caters to diverse socioeconomic backgrounds.

Table 1: Socio and Demographic Characteristics (N-300)

Content	Aspect	Frequency	Percentage
Gender	Male	152	51
	Female	148	49
Age	18-20	178	59
	21-23	118	39
	24-26	4	1
Religion	Hindu	7	2
	Muslim	2	1
	Christian	289	96
	Others	2	1
Marital Status	Married	5	2
	Not married	295	98
Caste	General	8	3
	OBC	2	1
	ST	287	96
	SC	3	1
Type of family	Nuclear Family	161	54
	Joined Family	43	14
	Extended Family	89	30
	Others	7	2
Socio-economic status	Upper class (I)	3	1
	Upper-Middle class (II)	33	11
	Lower-Middle class (III)	197	66
	Upper-Lower class (IV)	65	22
	Lower class (V)	2	1

These initial insights, gleaned from the seemingly mundane details of Table 1, hold the potential to enrich the study beyond the immediate statistical analysis. By delving deeper into the "whys" behind these demographic trends, you can gain a nuanced understanding of who your research truly represents and how their unique characteristics might influence their experiences and outcomes. Remember, your participants are not mere numbers; they are individuals with stories, beliefs, and aspirations that shape their engagement with any educational program. Embrace the richness of diversity within your data and let it guide you towards a more holistic and impactful understanding of your research subject.

Assessing the measurement:

"The reliability of a measurement is the ability to consistently achieve the same result under the same conditions. This is essential for the accuracy and reliability of the data collected. If the method is unreliable, the data may be distorted and unreliable, which can have a negative effect on the conclusions or decisions made on that data" (Middleton, 2023). "Cronbach's α (CA) was utilized to measure the internal consistency of items and was assessed" (Pituch and Lee, 2006). Hair *et al.* (2014), recommended the "CA values should be above 0.60 or 0.80 which would be considered appropriate".

According to Chiang (2015), "validity is the extent to which the scores from a measure represent the variable they are intended to". Validating TAM requires comparing our theoretical predictions with actual observations. It is crucial to ensure that the models align with the real world, allowing individuals to have complete confidence in their findings. Fornell and Larcker (1981) suggested:"three methods to examine the convergent validity. These include item reliability (CA), composite reliability (CR), and average variance extracted (AVE)".

Table 2 shows the content of the TAM which consists of 4 contents namely PU,PEOU, AATU and BI with 4 questions each which adds up to 16 questions. Factor loading is the correlation coefficient for the variable

Table 2: Reliability and Validity (n-300)

Content	Item	F. Loading	C.A	C.R	A.V. E
PU	PU1	0.907	0.99	0.84	0.81
	PU2	0.904			
	PU3	0.903			
	PU4	0.902			
PEOU	PEOU1	0.851	0.96	0.87	0.79
	PEOU2	0.85			
	PEOU3	0.829			
	PEOU4	0.828			
ATTU	ATT1	0.844	0.92	0.83	0.76
	ATT2	0.844			
	ATT3	0.813			
	ATT4	0.812			
BI	BI1	0.893	0.94	0.85	0.78
	BI2	0.876			
	BI3	0.875			
	BI4	0.827			

and factor. Factor loading shows the variance explained by the variable on that particular factor (Middleton, 2023). Factor analysiswas to be >0.7 representing the factorsthat extract sufficient variance from the variable in this case all 16 items were more than 0.7, meaning it was sufficient. (CA) were all higher than 0.6 with an average range of 0.9 which was considered reliable. The (CR) had an average range of 0.8 which is more than the suggested range indicating that it was appropriate. The (AVE) were all higher than the required range with an average of 0.7 resulting in an acceptable range.

Gefen and Straub (2005) had mentioned that "discriminant validity is shown when each measurement item correlates weakly with another construct except for the ones to which it is theoretically associated. Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards". "Discriminant validity can be evaluated by assessing the cross-loadings among constructs, by using Fornel-Larcker criterion and Heterotrait- Monotrait Ratio of correlation (HTMT)" (Pinheiro, 2017).

In Table 3 the discriminant validity was evaluated by using "HTMT which conveys that all the HTMT values happen to be lower than 0.85" (Kline, 2010), indicating a satisfactory criteria of discriminant validity.

Table 3: Heterotrait-Monotrait Ratio of Correlation (HTMT) (n-300)

Content	BI	PE	PEOU
BI			
PE	0.799		
PEOU		0.679	
ATTI			0.664

To obtain the discriminant validity, the "Fornell-Larcker indicator" was utilized. In Table 4, it can be seen that AVE square root was more than the correlation which was valued amidst the contents, meaning a satisfactory discriminant validity.

Table 4: Fornell-Larcker Criterion (n-300)

Content	BI	PE	PEOU	ATTI
BI	0.919			
PE	0.624	0.88		
PEOU	0.682	0.679	0.895	
ATTI	0.663	0.553	0.656	0.835

Suitability of data:

Ene *et al.* (2020) suggested "to test the appropriatenessof the data for farther analysis the 'Kaiser-Meyer-Olkin' KMO and 'Barlett's Test of Sphericity' can be used to measure the adequacy of the samples". Table 5 shows that KMO was 0.92 which was more than the acceptable range (0.7) and Bartlett's Test wasp erceived to be significant at p value equal to or less than 0.000 indicating that it is suitable for further analysis.

Table 5: KMO and Bartlett's Test (n-300)

Content		Value
KMO		0.92
Bartlett's Test	Approx. Chi-Square	9671.651
	df	120
	Sig.	0

Hypothesis testing:

The five hypotheses were tested to confirm the relationship between the construct, the hypothesis is as follows;

H1- PU has a positively significant effect on ATTU.

H2- PU has a positively significant effect on BI to use a technology.

H3- PU has a positively significant effect on ATTU of technology.

H4- PEOU has a positively significant effect on BI to use a technology.

H5- ATTU of technology has a positively significant effect on BI to use a technology.

The Structural Equation Modeling (SEM) analysis presented in Fig. 2 and Table 6 provides robust support for all five hypotheses proposed in the study. The table displays the results of hypothesis testing, where each

Table 6: Hypothesis Testing (n-300)

Hypothesis	Path	Effect	β	S.E	t	p	Results
H1	PU → ATTU	Positive	0.147	0.036	2.757	0	Supported
H2	PU → BI	Positive	0.219	0.041	3.603	0	Supported
H3	PEOU → ATTU	Positive	0.224	0.051	3.448	0	Supported
H4	PEOU → BI	Positive	0.312	0.047	4.109	0	Supported
H5	ATTU → BI	Positive	0.431	0.049	5.778	0	Supported

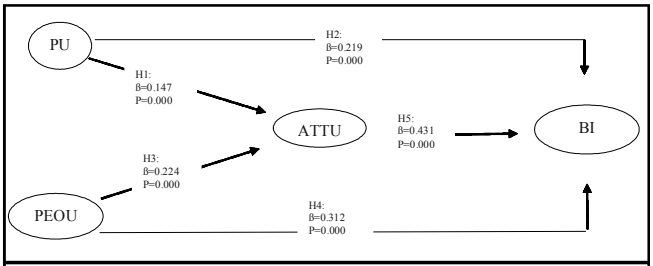

Fig. 2 : Structural model analysis

hypothesis represents a relationship between two variables. Key components such as path coefficients (β), standard errors (S.E.), t-values (t), p-values (p), and the overall results determine the validity of these hypotheses (Almaiah *et al.*, 2022).

In detail, the hypotheses (H1 to H5) each define different relationships between the variables. The path indicates the direction of the relationship between the independent and dependent variables, while the effect shows the nature of the relationship, which is positive in all cases. The beta coefficient (β) represents the standardized path coefficient, reflecting the strength and direction of each relationship. The standard error (S.E.) measures the precision of the path coefficient estimate, while the t-value assesses the significance of the path coefficient by comparing it to its standard error (Al-Rahmi *et al.,* 2021). A p-value less than 0.05 typically signifies statistical significance, indicating that the relationship is unlikely to have occurred by chance.

Hypothesis 1 (H1) suggests that Perceived Usefulness (PU) has a positive and significant effect on Attitude Toward Use (ATTU), supported by a beta coefficient of 0.147 and a p-value of 0.000. This implies that users who perceive a system as useful are more likely to have a favorable attitude toward using it. Similarly, Hypothesis 2 (H2) shows that PU positively affects Behavioral Intention (BI), with a beta coefficient of 0.219 and a p-value of 0.000, indicating that users who find a system useful are more inclined to intend to use it. Hypothesis 3 (H3) reveals that Perceived Ease of Use (PEOU) positively influences ATTU, supported by a beta coefficient of 0.224 and a p-value of 0.000. This finding suggests that systems perceived as easy to use are viewed more favorably, thereby enhancing users' attitudes. Hypothesis 4 (H4) indicates that PEOU has a positive effect on BI, with a beta coefficient of 0.312 and a p-value of 0.000. This suggests that ease of use is a major determinant in whether users plan to use a system, as users are more likely to intend to use something they find easy. Finally, Hypothesis 5 (H5) demonstrates that ATTU has a significant positive effect on BI, evidenced by the highest beta coefficient of 0.431 and a p-value of 0.000, indicating that attitude is the most influential factor in determining behavioral intention.

Overall, the analysis supports all five hypotheses, showing significant positive relationships between perceived ease of use, perceived usefulness, attitude toward use, and behavioral intention. These findings align with theoretical models like the Technology Acceptance Model (TAM), where both perceived usefulness and perceived ease of use are crucial factors influencing user attitudes and behavioral intentions (Alturki and Aldraiweesh, 2022). By focusing on these key factors, developers and implementers can create technologies that are not only valuable but also user-friendly, maximizing the likelihood of successful adoption and integration into users' lives.

Conclusion:

The research examined the factors influencing the adoption of Coursera, an educational application, among students in Aizawl City, Mizoram. Using the Technology Acceptance Model (TAM), the study investigated the relationships between perceived usefulness (PU), perceived ease of use (PEOU), attitude towards technology use (ATTU), and behavioral intention (BI) to use Coursera.The study found that both PU and PEOU significantly predict ATTU and BI, suggesting that students are more likely to adopt Coursera if they perceive it as useful and easy to use. Additionally, ATTU significantly influences BI, indicating that positive attitudes towards technology use are associated with higher

intentions to use Coursera.The study's limitations include its focus on Coursera users in Aizawl City and its use of a relatively small sample size of 300 participants. Furthermore, the TAM model was only extended with ATTU, and other constructs could be explored in future research.Despite these limitations, the study provides valuable insights into the applicability of the TAM model to educational applications. Understanding the factors influencing Coursera adoption can help educational institutions and application developers create more user-friendly and engaging learning experiences, ultimately promoting online learning adoption. Future research could expand on this study by increasing the sample size and including geographically diverse samples.

List of Abbreviations:

TAM-"Technology Acceptance Model"
SEM- "Structural Equation Modeling"
TRA- "Theory of Reasoned Action"
PU- "Perceived Usefulness"
PEOU- "Perceived Ease of Use"
ATTU-"Attitude Towards Technology Use"
BI- "Behavioral Intention"
MOOC- "Massive open online course"
CA-"Cronbach's α"
CR-"Composite Reliability"
AVE-"Average Variance Extracted"
HTMT- "Heterotrait- Monotrait Ratio of correlation"
KMO- "Kaiser-Meyer-Olkin"

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