



# Determining The Intention To Use Smartphones For Learning Among University Students In Gorontalo

Zulham Sirajuddin<sup>1\*</sup>, Mohammad Zubair Hippy<sup>2</sup>, Muhammad Rizq Gobel<sup>3</sup>,  
Rhamadan Rezki Pratama<sup>4</sup>

<sup>1234</sup> Fakultas Pertanian, Universitas Negeri Gorontalo, Gorontalo, Indonesia

Zulham@ung.ac.id

## Abstract

The use of Information and Communication Technology (ICT) equipment and media, such as smartphones utilizing Internet technology, has been widely adopted in many higher education institutions. The purpose of this study was to identify students' intentions to use smartphones for learning in college. The method employed in this research was descriptive quantitative, involving 205 students of the Department of Agribusiness at Universitas Negeri Gorontalo. Interviews were conducted with questionnaire, employing the Technology Acceptance Model (TAM) theory lens, specifically focusing on perceived usefulness (PU), perceived ease of use (PEU), and intention to use (IU). The results of this study indicate that both PU and PEU serve as predictors of students' intention towards integrating smartphones into their academic activities, particularly in the context of learning. Consequently, it can be inferred that smartphones possess substantial potential as ICT tools capable of enhancing the learning experience within university settings. Thus, it can be concluded that smartphones have the potential to be used as ICT-based learning media.

**Keywords:** Smartphone, Learning, ITC, Students

## 1. INTRODUCTION

Over the past ten years, there has been a significant rise in the adoption of Information and Communication Technology (ICT) equipment globally, including in Indonesia. ICT serves as a tool to expedite the flow of information across communication channels locally. It enables users to access information swiftly and stay updated. According to Hernandez [1], utilizing ICT has become indispensable for functioning in a technologically advanced society. The rise in ICT adoption is intricately linked to the burgeoning reliance on the Internet within Indonesia. The metric for gauging Internet utilization is Internet penetration, which quantifies the proportion of Internet users within a specific population. By 2023, Indonesia's Internet penetration had soared to 78.19%, encompassing roughly 221.56 million users amidst the nation's total populace of 278.69 million individuals. This surge in penetration starkly contrasts with the 2014 figures, where only 34.9% of the total

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The original version of the chapter has been revised. First author name was incorrectly spelled. The name of the first author has been corrected. A correction to this chapter can be found at [https://doi.org/10.2991/978-2-38476-360-3\\_138](https://doi.org/10.2991/978-2-38476-360-3_138)

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population were Internet users, as reported by the Association of Indonesian Internet Provider Services [2]. This exponential growth underscores the pivotal role of the Internet in driving the widespread adoption of ICT across various sectors of Indonesian society, from education and business to governance and communication. Such a profound expansion not only reflects the increasing accessibility of digital technologies but also signals a transformative shift towards a more digitally connected and empowered community.

In Indonesia, ICT pervades virtually every sector, spanning both commercial and non-commercial domains, including education, whether formal or informal. According to Sihotang [3], educators must equip themselves to embrace the challenges posed by the Industry 4.0 era, cultivating competencies such as adaptability, flexibility, creativity, and effective communication. The integration of ICT holds significant potential for enhancing the quality of teaching and learning experiences across both formal educational institutions and informal settings. Among formal education systems, higher education institutions, particularly universities, stand to benefit from the utilization of ICT tools such as smartphones, given that a considerable portion of ICT users, including smartphones, laptops, and computers, consists of young students. This demographic, aged 12-27 (Gen-Z) and aged 28-42 (Millennial), accounts for 34,40% and 30,62% respectively of Internet users, as reported by AJPII, almost matching the overall Internet penetration rate of 78.19%. These statistics underscore the familiarity and comfort that youth and students exhibit with Internet technologies, paving the way for innovative approaches to education leveraging ICT resources. Such initiatives not only cater to the preferences and habits of the digital-native generation but also hold promise for fostering more engaging and effective learning environments in the evolving landscape of education.

The integration of ICT tools and digital media, including smartphones leveraging Internet technology, has become widespread across numerous higher education institutions. These technologies serve various purposes, functioning as both supplements to traditional education and as primary conduits for distance learning initiatives. For instance, platforms like Edmodo exemplify the potential of e-learning to enhance teaching and learning experiences by facilitating continuous interaction between educators and students beyond conventional classroom hours [4]. Additionally, the adoption of hybrid media solutions for lectures has gained traction, encompassing class management platforms like Google Classroom and Microsoft Teams, as well as video conferencing tools such as Zoom and CloudX. Leveraging Internet-based media in education not only holds the promise of augmenting student learning outcomes but also serves to alleviate monotony during classroom sessions. Saputra and Salim[5] posit that the integration of ICT tools can significantly bolster the quality of student learning experiences on campus, particularly by expediting coursework completion and fostering a dynamic and engaging educational environment. This multifaceted integration of ICT in higher education underscores its transformative potential in reshaping traditional teaching methodologies and equipping students with the digital competencies essential for success in the modern knowledge economy.

In light of these considerations, this study was initiated to explore the viability of incorporating smartphones as an alternative educational tool within university settings. Drawing upon the Technology Acceptance Model (TAM) proposed by Davis

[6], the research aims to assess students' attitudes towards smartphones as ICT devices. TAM posits two key dimensions influencing users' intentions regarding ICT adoption: perceived usefulness (PU) and perceived ease of use (PEU). The PU dimension reflects the extent to which users perceive ICT devices as beneficial, while the PEU dimension gauges users' perceptions of the ease with which they can utilize these devices. Consequently, the primary objective of this investigation is to identify students' intention to use smartphone for learning in college and its determinants. By delving into students' attitudes towards smartphone usage, the study seeks to provide insights into the potential efficacy of leveraging these ubiquitous devices as educational tools within university environments.

## 2. METHODS

This study adopts a quantitative descriptive approach, aligning with positivism research methodology, which employs research instruments and statistical data analysis to investigate population units [7]. The research population comprises students actively enrolled in the Department of Agribusiness, at Universitas Negeri Gorontalo in Gorontalo Province during the 2023/2024 academic year, totaling 435 students. An online survey methodology was employed for data collection, utilizing the census method wherein the entire research population was invited to participate. The survey instruments were designed through the lens of the Technology Acceptance Model (TAM) by Davis[6], focusing on variables such as perceived usefulness (PU) and perceived ease of use (PEU) as independent variables, and intention to use (IU) as a dependent variables. Each variable construct comprised several items, as delineated in Table 1.

**Table 1.** Variables and items used in this research

| Variables                                      | Items                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Perceived Usefulness<br>(independent variable) | <ul style="list-style-type: none"> <li>●Using a smartphone in lectures is very useful for me</li> <li>●Using smartphones in lectures really saves tim</li> <li>●Doing college assignments is very efficient because of smartphones</li> <li>●I can complete college assignments more quickly by using a smartphone</li> <li>●The quality of my coursework has improved because of the help of a smartphone</li> <li>●Doing college assignments is much easier if you use a smartphone</li> <li>●In general, using smartphones in lectures really helps me</li> </ul> |

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Perceived Ease of Use<br>(independent variable) | <ul style="list-style-type: none"> <li>● Using a smartphone to do assignments during college is quite easy for me</li> <li>● It was easy for me to learn how to use a smartphone to do my assignments</li> <li>● I very rarely have difficulty using my smartphone to do my assignments</li> <li>● Even if there are difficulties in using a smartphone to do assignments, I can quickly find a solution</li> <li>● I can use my smartphone to do my assignments whenever I want</li> <li>● If there is a problem with my smartphone, it is easy to fix</li> <li>● In general, it is easy to use a smartphone to carry out tasks</li> </ul> |
| Intention to Use<br>(dependent variable)        | <ul style="list-style-type: none"> <li>● I intend to use a smartphone to do assignments on campus whenever I want</li> <li>● I want to continuously use my smartphone to do my assignments</li> <li>● I will increase the use of smartphones in doing assignments</li> <li>● I will always have a smartphone so I can do my assignments well</li> </ul>                                                                                                                                                                                                                                                                                     |

Respondents were prompted to provide their responses using a Likert scale with five levels: strongly agree, agree, neutral, disagree, and strongly disagree. Additionally, demographic information and details regarding access to ICT equipment (smartphones and computers/tablets) and popular social media platforms (Facebook, Instagram, TikTok, and Twitter) were collected. Invitations to complete the online questionnaire, hosted on the Google Form platform, were sent to all members of the population. Throughout the data collection phase, respondents received three reminders. This multi-tiered reminder system aimed to maximize the response rate. Consequently, a total of 205 respondents consented to participate and completed the online questionnaire, resulting in a response rate of 47.13%. Subsequently, the gathered data were tabulated and analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.

### 3. RESULTS AND DISCUSSION

#### 3.1 Respondents characteristics

This study enlisted a total of 205 participants, all of whom are enrolled students within the Agribusiness Department at Universitas Negeri Gorontalo for the academic

year 2023/2024. Situated in Gorontalo Province, Indonesia, Universitas Negeri Gorontalo stands as a prominent institution dedicated to fostering academic excellence and innovation, particularly in leveraging digital media to enhance student learning experiences. The university's commitment to embracing technological advancements aligns seamlessly with the contemporary educational landscape, where digital tools play an increasingly integral role. Table 2 provides a comprehensive overview of the characteristics and pertinent details pertaining to the respondents involved in the research.

**Table 2.** Respondents' characteristics

| Item                             | Response |           |
|----------------------------------|----------|-----------|
|                                  | n        | $\bar{x}$ |
| Gender                           |          |           |
| Male                             | 77       |           |
| Female                           | 129      |           |
| Average smartphone use (in year) |          | 5.52      |
| Aptitude in using Smartphone*    |          | 4.05      |

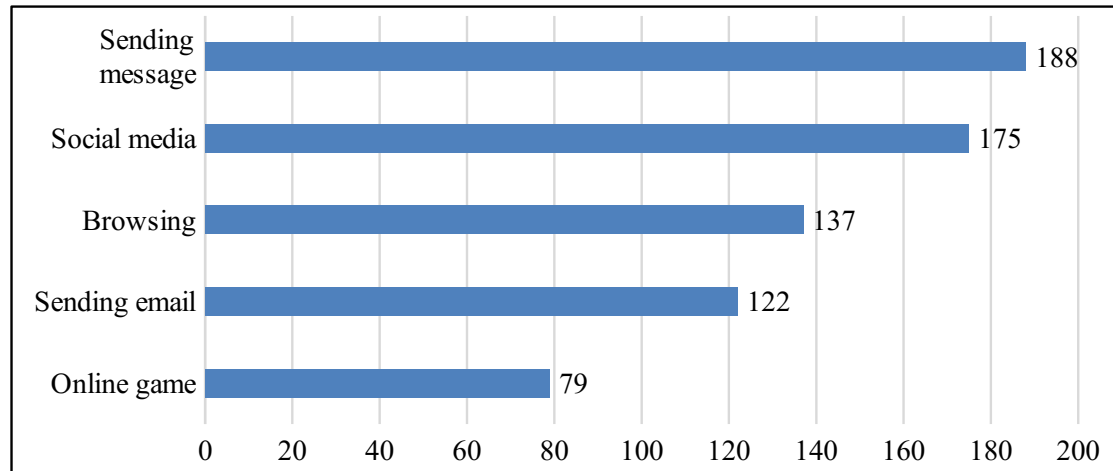
\*ranging from 1 (unskilled) to 5 (skilled)

Table 1 presents a striking revelation that a significant majority of the respondents are female, diverging from the typical gender distribution observed across Gorontalo Province. This is in contrast to the general population demographics in Gorontalo Province, where males tend to outnumber females [8]. This disparity highlights the prevailing dominance of women at the undergraduate education level. Moreover, the data from Table 1 indicates that the average duration of smartphone ownership among students stands at approximately 5.52 years, suggesting a prolonged engagement with these technological tools. Such extensive exposure aligns with the students' considerable proficiency in utilizing smartphones for academic purposes, as evidenced by their advanced aptitude in completing college assignments. Consequently, it can be inferred that students exhibit commendable skills in smartphone usage, particularly within the academic context, reflecting a landscape where female representation in education is notable, and where students demonstrate a noteworthy mastery of smartphone technology, particularly in their scholarly activities.

### 3.2 Use of smartphone among students

The utilization of ICT equipment and media is witnessing a surge in adoption among the populace, extending to Gorontalo Province as well. In this study, ICT equipment encompasses devices facilitating Internet access and various internet-related functionalities such as email and social media platforms. Specifically, the research focuses on Android smartphones/iPhones and computers or laptops as ICT tools under scrutiny. These selections were deliberate, considering the widespread popularity of smartphones and computers/laptops among students. Notably,

smartphones serve as indispensable communication tools both on and off campus. Table 2 depicts the frequent use of smartphone by the respondents. This pervasive presence underscores the pivotal role of smartphones in modern communication and highlights their significance as a primary channel for accessing digital resources and services.

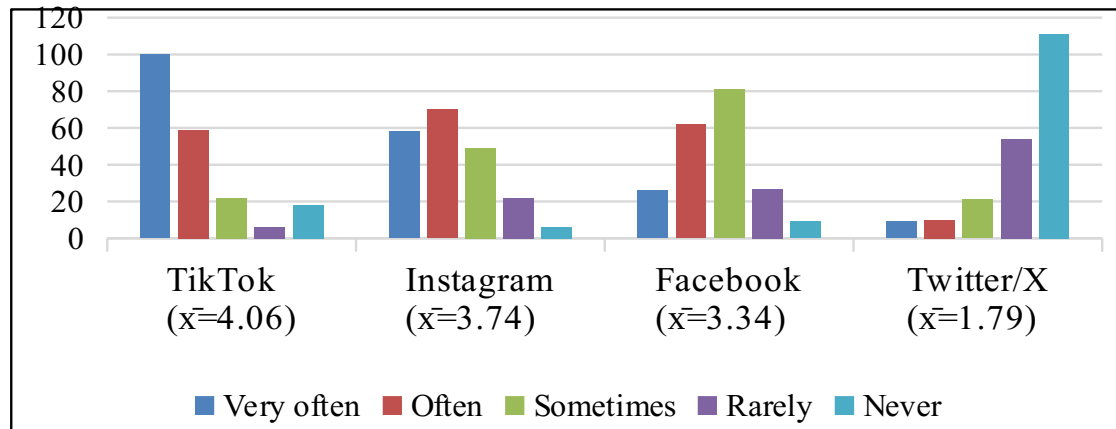


**Figure 1.** Frequent use of smartphone among students to do activities

Figure 1 provides insights into the predominant smartphone usage patterns among respondents, highlighting communication via messaging apps and access to social media as primary activities. The elevated engagement in these pursuits underscores their significance in the respondents' digital lives. Research by Thomas et al. [9] corroborates this observation, revealing that university students frequently rely on social media platforms to combat feelings of loneliness, particularly as they navigate the transition from high school to college life, often using these platforms to foster offline social connections. Furthermore, the data suggests a substantial utilization of smartphones for web browsing and email correspondence, indicating an active pursuit of information retrieval and sharing among students. This underscores the imperative of digital literacy, enabling students to discern and utilize pertinent information effectively in their daily lives. Concurrently, while a segment of students utilizes smartphones for online gaming, this cohort represents a minority, comprising less than half of the total respondents, delineating diverse preferences within smartphone usage habits. Thus, it elucidates the multifaceted role of smartphones in modern student life, underscoring the need for adept digital skills to navigate the wealth of information and social interactions facilitated by these devices.

In addition to examining smartphone usage patterns, this study delved into the prevalent utilization of smartphones for accessing various social media platforms, including Facebook, Instagram, TikTok, and Twitter or X. These platforms stand out as some of the most widely embraced social media channels among the youth demographic in Indonesia. The insights gleaned from this analysis are invaluable in comprehending the pivotal role of social media as supporting tools for disseminating pertinent information to students, thereby potentially enhancing their academic performance. Figure 2 illustrates the recurrent engagement with social media platforms via smartphones, underscoring the significance of these digital channels in the daily lives of students. This data not only sheds light on the popularity of social

media but also underscores their potential as platforms for educational enrichment and communication. By harnessing the power of social media effectively, educators and institutions can cultivate engaging and informative content tailored to students' needs, thereby fostering a conducive learning environment both inside and outside the classroom.



**Figure 2.** Frequent use of smartphone among students to access social media platform

Figure 2 provides insights into the frequency of social media usage, encompassing popular platforms such as Facebook, Instagram, and TikTok, with response options ranging from "never" (assigned a value of 1) to "very often" (assigned a value of 5). Social media serves as a digital arena where young individuals convene to forge friendships and engage in social interactions, thereby exerting influence over their social milieu—a phenomenon commonly referred to as social influence. Rigopoulou et al.[10] posit that this social influence factor can significantly impact the compatibility dimension of smartphone usage, consequently fostering positive perceptions regarding the usability (PU) aspect of smartphone utilization. Furthermore, this ripple effect extends to students' overall perceptions of the utility of smartphones in their daily lives. In essence, the interconnectedness of social media interactions and smartphone usage underscores a symbiotic relationship wherein social dynamics shape technological perceptions and vice versa. This integration of social influence theories with smartphone usability elucidates the intricate interplay between digital platforms and individual perceptions, offering insights into the nuanced dynamics of contemporary digital culture among young demographics. Moreover, it underscores the need for a holistic understanding of the multifaceted influences that shape attitudes towards technology adoption and usage in today's interconnected society. Figure 2 unveils TikTok as the predominant social media choice among students, with Instagram and Facebook trailing behind in terms of usage frequency. Numerous studies corroborate TikTok's widespread appeal, with its utility extending beyond mere entertainment. Notably, TikTok has emerged as a burgeoning marketplace for e-commerce, offering a convenient platform for trading and buying/selling goods. The ease of transactions and affordability of products within the TikTok marketplace contribute to its popularity among students seeking cost-effective shopping options. However, it's worth noting that platforms like TikTok also harbor educational potential. For instance, TikTok has been leveraged as a tool to

enhance English language proficiency among students, exemplifying its versatility as a learning medium [11],[12],[13]. This multifaceted nature of TikTok underscores its evolving role in both social and educational spheres, embodying a dynamic platform that caters to diverse needs and interests among student communities.

### 3.3 Respondents perception on the Use of Smartphone

The study delved into how students perceive the role of smartphones as tools for ICT. To gauge these perceptions, researchers employed the TAM theory framework pioneered by Davis [6]. This theoretical model posits that two key factors shape an individual's inclination towards embracing or shunning the use of ICT: perceived usefulness (PU) and perceived ease of use (PEU). In essence, individuals assess the utility and convenience offered by smartphones in facilitating their daily tasks and interactions, weighing these factors in their decision-making process regarding technology adoption. By scrutinizing these dimensions, the study sought to gain deeper insights into the nuances of individuals' attitudes towards smartphone utilization within the realm of ICT. Therefore, Table 3 shows respondents perception on the use of smartphone.

**Table 3.** Respondents perception on the use of smartphone

| Variables                                                                                             | Frequency |        |    |    |     |
|-------------------------------------------------------------------------------------------------------|-----------|--------|----|----|-----|
|                                                                                                       | S<br>D    | D      | N  | A  | SA  |
| <b>Perceived Usefulness</b>                                                                           |           |        |    |    |     |
| Using a smartphone in lectures is very useful for me                                                  | 4         | 2      | 12 | 41 | 146 |
| Using smartphones in lectures really saves time                                                       | 6         | 2      | 33 | 83 | 81  |
| Doing college assignments is very efficient because of smartphones                                    | 3         | 7      | 25 | 65 | 105 |
| I can complete assignments more quickly by using a smartphone                                         | 6         | 7      | 35 | 75 | 82  |
| The quality of my assignment has improved because of the help of a smartphone                         | 2         | 1<br>0 | 38 | 69 | 86  |
| Doing college assignments is much easier if using a smartphone                                        | 4         | 5      | 38 | 68 | 90  |
| In general, using smartphones really helps me                                                         | 5         | 2      | 29 | 63 | 106 |
| <b>Perceived Ease of Use</b>                                                                          |           |        |    |    |     |
| Using a smartphone to do assignments during college is quite easy for me                              | 5         | 4      | 36 | 76 | 84  |
| It was easy for me to learn how to use a smartphone to do my assignments                              | 3         | 3      | 41 | 87 | 71  |
| I rarely have difficulty using my smartphone to do my assignments                                     | 2         | 1<br>4 | 61 | 81 | 47  |
| Even if there are difficulties in using a smartphone to do assignments, I can quickly find a solution | 1         | 7      | 48 | 90 | 59  |
| I can use my smartphone to do my assignments whenever I want                                          | 4         | 5      | 46 | 72 | 78  |
| If there is a problem with my smartphone during assignments, it is easy to fix                        | 3         | 2<br>5 | 79 | 59 | 39  |
| In general, it is easy to use a smartphone to finish                                                  | 5         | 6      | 36 | 73 | 85  |



| my assignments                                                           |           |           |            |            |            |
|--------------------------------------------------------------------------|-----------|-----------|------------|------------|------------|
| Intention to Use                                                         |           |           |            |            |            |
| I intend to use a smartphone to do assignments on campus whenever I want | 6         | 10        | 55         | 70         | 64         |
| I intend to continuously use my smartphone to do my assignments          | 8         | 27        | 64         | 59         | 47         |
| I will increase the use of smartphones in doing assignments              | 4         | 18        | 60         | 71         | 52         |
| I will always have a smartphone so I can do my assignments               | 3         | 16        | 49         | 72         | 65         |
| <b>Total</b>                                                             | <b>30</b> | <b>35</b> | <b>210</b> | <b>464</b> | <b>696</b> |

Note: SD (Strongly Disagree), D (Disagree), N (Neither disagree or agree), A (Agree), SA (Strongly Agree)

The findings derived from the data analysis presented in Table 3 unveil a prevailing consensus among respondents regarding the commendable usability of smartphones, as perceived by them. This collective affirmation underscores a positive inclination towards PU of smartphone ICT tools, suggesting an overarching endorsement of smartphones in various facets of daily life. Specifically, in terms of education, the data highlighted many benefits associated with integrating smartphones into learning activities. Notably, smartphones are perceived as instrumental in enhancing students' comprehension of course material and fostering deeper engagement with concepts and contexts, thereby potentially bolstering learning outcomes and retention rates. Furthermore, the data indicates a favorable PEU of smartphones in the learning process, implying that students find smartphones to be accessible and user-friendly tools for educational purposes. This aligns with Soleimani et al. [14] findings, which indicate that the perceived benefits of eLearning systems are a key factor in the successful implementation of eLearning methods in higher education. Additionally, Ahmad et al. [15] noted that technological difficulties in using eLearning systems affected the level of engagement in digital education.

However, despite this favorable outlook, the data also sheds light on the existing constraints posed by complex e-learning systems, indicating untapped potential for innovation and technological advancement in learning environments. Hence, there emerges a pressing need to facilitate the seamless integration of smartphones into educational settings, necessitating initiatives such as training programs, technical support provisions, and enhancements in accessibility. Moreover, the data highlights a notable IU on smartphone among students towards adopting smartphones in their learning activities, underscoring their readiness to leverage technology for educational pursuits. This collective receptivity underscores a fertile ground for leveraging smartphones as transformative tools in the educational landscape, necessitating concerted efforts to harness this potential and optimize learning outcomes through innovative technological integration strategies. Punjani & Mahadevan [16] contended that online learning requires advanced communication skills, with strong online communication abilities enhancing the perceived benefits and intentions toward online learning. Moreover, Müller et al. [17] highlighted the challenge of meeting diverse student needs, particularly regarding equity, as students lacking access to

supportive environments and technologies (such as reliable internet) are at a disadvantage.

### 3.4 Determining intention to use smartphone for learning

In the comprehensive compilation presented in Table 4, the results stemming from a series of multiple regression statistical tests are meticulously laid out for scrutiny. Within this statistical landscape, the findings unfurl with remarkable clarity, revealing a notable F value of 205.696, alongside an exceptionally diminutive p-value of .000. Such statistical revelations bear testament to the concurrent and substantive influence exerted by both PU and PEU on the IU within the dynamic realm of student learning. Delving deeper into the nuances of this relationship, it becomes evident that both PU and PEU partially wield significant effect over IU, as evidenced by their respective p-values of .002 and .000, each of which attains statistical significance at the alpha .01 threshold. Moreover, the R<sup>2</sup> emerges as a pivotal metric, illuminating the degree to which the variability observed in IU finds explanation through the interplay of PU and PEU. Noteworthy is the revelation that a substantial proportion, precisely 67.10%, of the variability characterizing IU finds explication through the combined effect of PU and PEU. Such a significant finding, as mentioned by Cohen's [18] classification, ascends to the rank of a large effect size, thus underscoring the profound effect of PU and PEU in shaping the behavioral intentions of students in the utilization of smartphone.

**Table 4.** Results of regression analysis of PU, PEU and intention to use

| Determinants          | Beta ( $\beta$ ) | t-value | Significance |
|-----------------------|------------------|---------|--------------|
| Perceived usefulness  | 0.193            | .135    | .002         |
| Perceived ease of use | 0.662            | .536    | .000         |
| <b>F-statistics</b>   | 205.696          |         |              |
| <b>Significance</b>   | .000**           |         |              |
| <b>R<sup>2</sup></b>  | .671             |         |              |

\*\*significant at p-value < .01

The findings derived from the statistical analyses indicate that both PU and PEU determine students' intention (IU) towards integrating smartphones into educational practices within campus environments. PU, representing the usability factor perceived from the standpoint of the users, particularly students in this context, plays a pivotal role. The more positively students perceive smartphones as beneficial tools for teaching and learning, the more inclined they become to utilize them. Similarly, PEU is influential; the smoother the experience of integrating smartphones into educational activities, the greater the motivation among students to incorporate them into their learning journey. Consequently, enhancing students' proficiency in leveraging smartphones for educational purposes becomes imperative, as it not only fosters their academic engagement but also heightens their interest in embracing smartphones as integral components of the learning process. Therefore, educators and institutions should prioritize initiatives aimed at enhancing students' skills in utilizing

smartphones for learning purposes, thereby nurturing a conducive environment for their academic advancement and technological integration.

#### 4. CONCLUSION

The findings yielded by this study yield several noteworthy insights. Primarily, it is evident that students harbor favorable perceptions regarding the utility and user-friendliness of smartphones, alongside a demonstrable interest in their utilization. Moreover, these perceptions of usefulness and convenience serve as predictive indicators of students' inclination towards integrating smartphones into various facets of their academic journey, particularly in the context of learning. Consequently, it can be inferred that smartphones possess substantial potential as ICT tools capable of augmenting the learning experience within university settings. Thus, it behooves stakeholders within the realm of education to capitalize on this potential and optimize the integration of smartphones into the learning ecosystem. By leveraging smartphones as educational aids, educators and administrators can cultivate dynamic learning environments that harness the transformative power of technology to enhance student engagement, facilitate knowledge acquisition, and foster holistic academic development. Therefore, as a recommendation for stakeholders in the education sector, proactive measures should be taken to harness the educational potential of smartphones, thereby bolstering the efficacy and relevance of contemporary learning methodologies.

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