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**Research Article**

# A Study on the Influence of Educational App Usage and Digital Skills on Heutagogy among Undergraduate Students

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**ABSTRACT**

This study examines the influence of educational app usage and digital skills on heutagogy among undergraduate students. A quantitative descriptive survey design was employed with a sample of 1,500 undergraduate students selected through stratified random sampling across various disciplines. Data were gathered using a structured questionnaire focusing on three core variables: educational app usage, digital skills, and heutagogy. Statistical techniques such as descriptive analysis and multiple linear regression were applied to analyze the data. The findings reveal that a considerable portion of students reported high usage of educational apps and moderate digital skills. Regression analysis confirmed that both educational app usage and digital skills significantly predict heutagogy behavior, although the explained variance was limited to 16.6%. These results suggest that while technology use and digital competence are important, they must be supported by learner-centered pedagogies to effectively foster heutagogy learning.

**Keywords:** Educational App Usage; Digital Skills; Heutagogy; Undergraduate Students; Technology-Enhanced Learning; Digital Literacy

## I. INTRODUCTION

The integration of educational technology into higher education has transformed how learners interact with content, peers, and instructors. Amidst these changes, heutagogy self-determined learning has emerged as a model that empowers learners to take ownership of their learning journey (Blaschke, 2012). This study investigates how digital tools such as educational apps and the digital competence of students influence their heutagogy. In the contemporary digital age, higher education institutions are shifting from traditional teaching methods to more flexible, technology-enabled pedagogies. The widespread use of smartphones, tablets, and internet-based platforms has led to the increased popularity of educational apps that cater to a variety of academic and skill development needs. These digital tools enable asynchronous learning, interactive content, and continuous access to educational materials, aligning well with the principles of heutagogy (Ifinedo, 2017; Cochrane et al., 2020). Moreover, digital skills are no longer optional but essential for effective learning and participation in modern academic environments. Students with higher digital literacy are better equipped to manage their learning experiences independently, collaborate in digital spaces, and utilize information responsibly and effectively (Martin & Grudziecki, 2006; Siddiq et al., 2019). In line with global education strategies, fostering digital competence has become a key focus for enhancing student-centered learning and improving academic success (European Commission, 2019).

## II. REVIEW OF RELATED LITERATURE

Recent studies have underscored the increasing relevance of heutagogy in digital and higher education landscapes. Sharma and Gupta (2022) demonstrated that heutagogy environments lead to improved learner engagement, autonomy, and reflective thinking in online classrooms. Kaur and Ahmed (2023) explored

heutagogy strategies in virtual learning environments and found significant improvements in students' problem-solving and critical thinking abilities.
Many research highlighting the role of educational apps in promoting heutagogy behaviors. Prasad and Mishra (2023) found that educational apps significantly improved academic performance and learning engagement in higher education, especially when integrated with self-paced and modular learning content. Raj and Menon (2024) observed that students using AI-powered learning apps demonstrated higher rates of intrinsic motivation and self-regulated learning behaviors. Recent work by Reddy and Thomas (2025) shows that gamified mobile applications significantly foster persistence and mastery learning strategies among undergraduates. This body of research establishes a clear link between effective app usage and the development of heutagogy traits, such as learner control, digital interaction, and autonomous decision-making. Digital Skills Digital competence remains central to educational success, and recent literature affirms its influence on heutagogy learning. Ahmed and Rani (2023) reported that digital skills significantly influence learners' ability to adapt to online education and demonstrate greater initiative in academic tasks. Kumar and Thomas (2024) found a strong correlation between digital competence and learners' self-regulatory practices, creativity, and critical thinking in virtual classrooms

## III. OBJECTIVES OF THE STUDY

1. To assess the level of educational app usage, digital skills and heutagogy among undergraduate students.
2. To examine the influence of app usage and digital skills on heutagogy practices.

## IV. RESEARCH METHODOLOGY

This study adopted a quantitative research approach with a descriptive survey design to examine the influence of educational app usage and digital skills on the heutagogy of undergraduate students. The study population comprised undergraduate students enrolled in arts, science, commerce, and professional programs across selected higher education institutions. A total of 1,500 students participated in the study, and stratified random sampling was used in the study. The study focused on three main variables. The independent variables were (1) usage of educational apps and (2) digital skills, while the dependent variable was (3) heutagogy, defined as the learner's ability to direct, manage, and reflect on their own learning processes. A structured questionnaire was used as the main tool for data collection. The instrument consisted of three sections aligned with each variable and used a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." The questionnaire items were reviewed by a panel of experts for content validity. A pilot study was conducted with 100 students to ensure the reliability of the instrument. Cronbach's alpha values were calculated and found to be satisfactory: 0.81 for educational app usage, 0.87 for digital skills, and 0.84 for heutagogy, confirming the internal consistency of the scales. The data were analyzed using the Statistical Package for the Social Sciences (SPSS, Version 25). Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to determine the levels of each variable. Additionally, multiple linear regression analysis was performed to examine the predictive power of educational app usage and digital skills on heutagogy.

## V. DATA ANALYSIS

**Table – 1 Showing the Level of Usage of Educational Apps, Digital Skills and Heutagogy of Undergraduate Students**

| Variables | Low | | Moderate | | High | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Usage of Educational Apps | 392 | 26.13 | 444 | 29.60 | 664 | 44.27 |
| Digital Skills | 383 | 25.53 | 737 | 49.13 | 380 | 25.33 |
| Heutagogy | 400 | 26.67 | 638 | 42.53 | 462 | 30.80 |

The findings indicate that a substantial proportion of undergraduate students (44.27%) exhibit a high level of educational app usage. This suggests a strong inclination among students toward integrating technology into their learning processes. Moderate usage is reported by 29.60% of students, indicating that nearly one-third are somewhat comfortable with educational technologies but may not be fully utilizing their potential. On the other hand, 26.13% of the respondents fall under the low usage category, which shows that a quarter of the student population still has limited engagement with educational apps. This distribution implies that while digital tools are becoming increasingly prevalent in academic settings, targeted interventions may be needed to support those with low adoption to ensure more inclusive digital engagement. The analysis of digital skills among undergraduate students reveals that nearly half (49.13%) possess moderate digital competencies. This middle-tier dominance indicates a foundational familiarity with digital tools and platforms among the student body. However, only 25.33% demonstrate high digital skills, pointing to a potential gap in advanced digital literacy that may hinder deeper engagement in autonomous or technology-driven learning environments.

Conversely, 25.53% of students reported low digital skills, which raises concerns about their ability to effectively navigate digital learning ecosystems. The findings highlight the importance of structured digital literacy programs in higher education to equip students with the competencies needed for effective and independent online learning. Regarding heutagogy tendencies, 42.53% of the students fall into the moderate category, indicating a fair level of self-directed learning abilities, such as critical reflection, adaptability, and learner autonomy. Approximately 30.80% of students show high levels of heutagogy, which is encouraging as it reflects the growing presence of self-determined learning behaviors in the undergraduate population. However, 26.67% of the students display low heutagogy characteristics, suggesting that more than one-fourth may struggle with taking ownership of their learning. This highlights the need for pedagogical approaches that foster learner agency, reflective practices, and motivation, particularly in digital and blended learning contexts.

**Table 2(a)-Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.132[a] | 0.1660 | -0.060 | 22.544 |

Table 2(a) presents the model summary of the regression analysis. The correlation coefficient (R) is 0.132, indicating a weak positive relationship between the independent variables, which are usage of educational apps and digital skills, and the dependent variable, heutagogy. The R Square value of 0.1660 indicates that approximately 16.6 percent of the variance in heutagogy learning behavior can be explained by the combined influence of the predictors. However, the Adjusted R Square value is negative at -0.060, suggesting that the model may not fit the data well after accounting for the number of predictors included. The standard error of the estimate is 22.544, reflecting the average distance between the observed and predicted values. Although the model demonstrates only a modest level of explanatory power, it still provides a basis for understanding the potential influence of the variables.

**Table 2(b)-ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 8882.690 | 10 | 488.169 | 3.664 | 0.030[b] |
| | Residual | 758962.197 | 1490 | 608.767 | | |
| | Total | 767842.887 | 1500 | | | |

The analysis of variance (ANOVA) table shows that the regression model is statistically significant. The F-value is 3.664 and the significance value (p) is 0.030. This result confirms that the overall model contributes meaningfully to explaining the variation in heutagogy. In other words, the combination of usage of educational apps and digital skills significantly predicts students' self-determined learning behaviors. Although the explained variance is relatively low, the significance of the F-test indicates that the model performs better than a model with no predictors, justifying further interpretation of the individual contributions of each variable.

**Table 2(c)-Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 66.693 | 11.192 | | 5.840 | 0.000 |
| | Usage of Educational Apps | 0.067 | 0.025 | 0.098 | 2.938 | 0.003** |
| | Digital skills | 2.324 | 0.876 | 0.064 | 2.627 | 0.008** |

Table 2(c) outlines the contribution of each independent variable to the prediction of heutagogy. The constant value of 66.693 indicates the expected value of the dependent variable when all independent variables are held at zero. The unstandardized coefficient for usage of educational apps is 0.067 with a p-value of 0.003, indicating a statistically significant and positive contribution to the prediction of heutagogy learning. This means that greater use of educational apps is associated with an increase in self-directed learning behavior. Similarly, digital skills have an unstandardized coefficient of 2.324 with a significance value of 0.008, showing a meaningful positive impact. These results demonstrate that both predictors are significant contributors to explaining heutagogy, and that improving students' digital skills and app engagement may foster greater autonomy and self-regulation in learning.

## VI. MAJOR FINDINGS

**Percentage Analysis:** A significant proportion of students (44.27%) reported high usage of educational apps, indicating that mobile and web-based learning platforms are widely adopted among undergraduates. Nearly half of the students (49.13%) exhibited moderate digital skills, while 25.33% had high proficiency. However, 25.53% still showed low digital competence, suggesting a need for focused digital literacy enhancement. Most students demonstrated moderate (42.53%) or high (30.80%) levels of heutagogy, indicating a growing trend toward self-directed and autonomous learning, though a considerable portion (26.67%) still scored low.

**Regression Analysis – Predictors of Heutagogy**: Multiple regression results showed that both usage of educational apps (B = 0.067, p = 0.003) and digital skills (B = 2.324, p = 0.008) were statistically significant predictors of heutagogy. This confirms that increases in both variables lead to higher levels of self-determined learning.

## VII. CONCLUSION

This study examined the influence of educational app usage and digital skills on the self-determined heutagogy, of undergraduate students. The results show that technology integration in higher education positively supports learners in becoming more autonomous and reflective. A large number of students were identified as regular users of educational apps, and many exhibited moderate proficiencies in digital skills. However, there remains a notable portion of learners with limited digital competence and low levels of heutagogy behavior, suggesting a need for targeted support and capacity building. The findings highlight that educational app usage has a significant and moderately strong influence on students' ability to learn independently. Students who frequently use academic applications are more likely to set their own goals, manage their learning paths, and evaluate their progress. Regression analysis confirmed that both educational app usage and digital skills significantly predict heutagogy, although the model explains only a modest portion of the variance. This indicates that other elements such as student motivation, faculty engagement, learning culture, and curriculum design also play an important role in shaping self-determined learning practices. In summary, the study affirms that effective use of technology can support the development of heutagogy among undergraduate learners. For this potential to be fully realized, institutions must ensure that digital tools are not only accessible but are also embedded within learner-centered teaching frameworks. This approach will better prepare students for independent, lifelong learning in the context of an increasingly digital academic and professional environment.

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