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Heutagogy and The Development of Digital Skills Among Undergraduate Students

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Abstract. This study investigates the relationship between heutagogy learning practices and the development of digital skills among undergraduate students in the Salem district of Tamil Nadu. A total of 773 students from various arts and science colleges were selected using a stratified random sampling technique. Two self-developed and validated tools were used: a Heutagogy Scale and a Digital Skills Scale. Descriptive and inferential statistical analyses were employed to assess differences based on gender and locality. The findings reveal that while overall heutagogy and digital skill levels do not significantly vary across gender and locality, specific dimensions such as explore, information navigation, and creative skills showed notable differences. The study highlights the potential of heutagogy in fostering digital competence and underscores the need for inclusive, learner-centered strategies in higher education to bridge digital divides and support self-determined learning.

Keywords - Heutagogy, Digital Skills, Undergraduate Students, Self-Determined Learning,

I. Introduction

Education is the process of acquiring knowledge, skills, values, and attitudes through formal, informal, and non-formal learning experiences.

It enables individuals to develop intellectually, socially, and morally to contribute meaningfully to society. Technology has played a pivotal role in transforming traditional learning environments into dynamic, interactive, and student-cantered spaces. By integrating digital tools and resources, educational institutions have revolutionized the way knowledge is delivered and consumed, enabling more personalized, efficient, and engaging learning experiences. One significant contribution of technology is the shift from teacher-cantered to learner-cantered approaches. Digital skills refer to the ability to use digital devices, communication tools, and networks to access, manage, create, and share information effectively.

These skills are essential for navigating and thriving in today's digital world, where technology permeates all aspects of life personal, professional, and academic. Digital skills can range from basic computer literacy to more advanced competencies,

including data analysis, coding, and digital collaboration Ferrari (2012). Heutagogy is a learner-centered educational approach that focuses on self-determined learning, where learners take full responsibility for what, how, and when they learn (Hase & Kenyon, 2000). Unlike traditional learning methods, heutagogy emphasizes learner autonomy, self-reflection, and adaptability, allowing individuals to develop skills and knowledge in a flexible and self-directed manner.

II. SCOPE OF THE STUDY

This study focuses on exploring the relationship between heutagogy approaches and the development of digital skills among undergraduate students. It aims to examine how self-determined learning principles such as learner autonomy, capability, and reflection contribute to students' ability to acquire, apply, and adapt digital competencies in academic and real-world contexts. The study will be limited to undergraduate students enrolled in [specific institution or institutions, if applicable] during the academic year.

It will include students from various disciplines to capture a broad understanding of digital skills integration across different fields. The study will assess students' perceptions, engagement with digital tools, and the extent to which heutagogy methods (e.g., self-paced learning, project-based tasks, digital collaboration) influence their digital literacy and critical thinking.

III. DELIMITATIONS OF THE STUDY

- The study was limited to undergraduate students studying in arts and science colleges.
- The present study has been limited to a sample of undergraduate students in the Salem districts of Tamil Nadu in India.
- This study was also limited by 773 undergraduate students (Both Boys and Girls).
- The present study is confined to only a few demographic variables gender, locality.
- As entire Tamil Nadu State is very difficult to cover in a single study like the proposed one. Hence, the samples are selected from Government, Government Aided and Private Colleges in Salem district.

IV. METHODOLOGY

Participants

The participants of 773 undergraduate students were selected from the Salem district in Tamil Nadu using a stratified random sampling technique for the present study.

Instrument

Heutagogy scale was developed by the investigator of undergraduate students containing thirty items and six dimensions viz, explore, create, collaboration, connect, share, reflect.

The maximum scale value: 150, Minimum value: 30 The reliability value is 0.847. The digital skills tool was used for the present study was developed by the investigator. The tool consists of 35 items with five-point scale and with six dimensions as communication skills, information navigation skill, social skill, creative skill and mobile usage skill. The reliability of the tool was established through the test-retest method with a score of 0.86 and through this the consistency of the scale was established.

Procedure and Data Analysis

Procedure

The study was conducted among 773 undergraduate students selected from various colleges in the Salem district of Tamil Nadu using a stratified random sampling technique. Prior to data collection, necessary permissions were obtained from the respective institutions.

The participants were informed about the purpose of the study and assured of confidentiality and voluntary participation. A structured questionnaire was developed, consisting of two major sections: one measuring students' exposure to and use of digital tools, and the other assessing their engagement in heutagogy learning practices (such as learner autonomy, self-reflection, and digital collaboration).

The questionnaire was validated by academic experts, and a pilot study was conducted to ensure clarity and reliability. Data were collected through both online and offline formats to ensure broader participation. Responses were anonymized and securely stored for analysis.

Data Analysis

The collected data were coded and entered into SPSS (Statistical Package for the Social Sciences) for analysis. Descriptive statistics such as mean, standard deviation, and percentage distributions were used to summarize the demographic and general trends in the data. Inferential statistics, including Pearson correlation and multiple regression analysis, were employed to examine the relationship between heutagogy practices and digital skill development. T-tests is conducted to identify significant differences based on demographic variables such as gender, academic discipline, and year of study.

V. RESULTS AND FINDINGS

Heutagogy: There is no significant difference in the heutagogy and its dimensions of undergraduate students based on the select sub-samples gender, locality.

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Table-1 Showing the 't' value of heutagogy and its dimensions of undergraduate students based on gender

Dimensions	Gender	N	Mean	S D	t value	p-value
Explore	Male	610	19.69	3.480	3.648	0.000*
	Female	890	20.38	3.719		
Create	Male	610	20.43	3.456	1.172	0.242
	Female	890	20.64	3.510		
Collaboration	Male	610	21.66	3.584	0.430	0.667
	Female	890	21.74	3.557		
Connect	Male	610	21.31	3.743	0.074	0.941
	Female	890	21.32	3.942		
Share	Male	610	21.49	3.669	0.512	0.608
	Female	890	21.39	3.846		
Reflect	Male	610	21.46	3.837	0.623	0.533
	Female	890	21.34	3.675		
Total Heutagogy	Male	610	126.03	13.590	1.094	0.274
	Female	890	126.80	13.155		

VI. INTERPRETATION & CONCLUSION

The above table-1 shows that the calculated 't' values of undergraduate students' digital skills. Among the seven cases in one case, significant difference is found at the 0.05 level. Hence the null hypothesis is not accepted in this case. In the other six cases, null hypothesis is accepted. Results of the study revealed that the male and female undergraduate students do not differ in create, collaboration, connect, share, reflect, and heutagogy and male and female undergraduate students do differ in explore dimension of heutagogy

Table-2 Showing the 't' value of heutagogy and its dimensions of undergraduate students based on locality

Variable	Locality	N	Mean	S D	t value	p-value
Explore	Rural	564	19.78	3.472	2.657	0.008*
	Urban	936	20.29	3.724		
Create	Rural	564	20.39	3.458	1.428	0.154
	Urban	936	20.65	3.505		
Collaboration	Rural	564	21.58	3.491	1.097	0.273
	Urban	936	21.78	3.611		
Connect	Rural	564	21.05	3.813	2.108	0.035*
	Urban	936	21.48	3.883		

Share	Rural	564	21.37	3.693	0.508	0.612
	Urban	936	21.47	3.823		
Reflect	Rural	564	21.40	3.748	0.065	0.948
	Urban	936	21.38	3.738		
Total Heutagogy	Rural	564	125.56	13.134	2.120	0.034*
	Urban	936	127.05	13.430		

Interpretation & Conclusion

The above table-2 shows that the calculated 't' values of undergraduate students' digital skills. Among the seven cases in three cases, significant differences were found at the 0.05 level. Hence the null hypothesis is not accepted in these cases. In the other four cases, null hypothesis is accepted. Rural and urban undergraduate students do not differ in create, collaboration, share, reflect dimensions of heutagogy. Results of the study revealed that the rural and urban graduate students do differ in explore, connect and overall value of heutagogy.

Digital Skills: There is no significant difference in the digital skills and its dimensions of undergraduate students based on the select sub-samples gender, locality.

Male and female undergraduate students do not differ in their digital skills and its dimensions

Table-3 Showing the 't' value of digital skills and its dimensions of undergraduate students based on gender

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Variable	Gender	N	Mean	S D	t value	p-value
OS	Male	610	19.88	3.284	0.188	0.851
	Female	890	19.85	3.445		
CS	Male	610	36.58	4.489	1.005	0.315
	Female	890	36.82	4.380		
INS	Male	610	29.65	3.526	2.318	0.021*
	Female	890	30.10	3.844		
SS	Male	610	21.50	2.727	0.075	0.011
	Female	890	21.48	2.739		
CRS	Male	610	22.74	2.204	3.658	0.000*
	Female	890	23.16	2.093		
MUS	Male	610	17.34	1.770	1.300	0.194
	Female	890	17.46	1.685		
Total DS	Male	610	147.70	7.410	3.059	0.002*
	Female	890	148.87	7.087		

Interpretation & Conclusion

The above table-3 shows that the calculated 't' values of undergraduate students' digital skills. Among the seven cases in three cases, significant differences were found at the 0.05 level. Hence the null hypothesis is not accepted in these three cases. In the other four cases, null hypothesis is accepted.

Results of the study revealed that the male and female undergraduate students do not differ in operation skills, communication skills, social skill, mobile usage skills dimensions of digital skills and male and female undergraduate students differ in information navigation skills, creative skills, and global value of digital skills.

Table-4 Showing the 't' value of digital skills and its dimensions of undergraduate students based on locality

Variable	Locality	N	Mean	S D	t value	p-value
OS	Rural	564	19.98	3.377	1.068	0.286
	Urban	936	19.79	3.380		
CS	Rural	564	36.76	4.526	0.288	0.773
	Urban	936	36.70	4.365		
INS	Rural	564	29.66	3.492	2.053	0.040*
	Urban	936	30.07	3.850		
SS	Rural	564	21.57	2.789	0.859	0.391
	Urban	936	21.44	2.700		
CRS	Rural	564	22.63	2.188	4.922	0.000*
	Urban	936	23.20	2.096		
MUS	Rural	564	17.43	1.686	0.191	0.848
	Urban	936	17.41	1.742		
Total DS	Rural	564	148.04	7.138	1.479	0.139
	Urban	936	148.60	7.297		

Interpretation & Conclusion

The above table 4 shows that the calculated 't' values of undergraduate students' digital skills. Among the seven cases in two cases, significant differences were found at the 0.05 level. Hence the null hypothesis is not accepted in these two cases. In the other five cases, null hypothesis is accepted. Results of the study revealed that the rural and urban undergraduate students do not differ in operation skills, communication skills, social skill, mobile usage skills and global value of digital skills and rural and urban undergraduate students differ in information navigation skills, and creative skills dimensions of digital skills.

Discussion and Conclusion

The present study explored the role of heutagogy practices in developing digital skills among undergraduate students in the Salem district of Tamil Nadu. The data analysis revealed several important insights. The study found no significant differences in overall heutagogy engagement across gender. However, male and female students differed significantly in the explore dimension, indicating possible differences in how each group initiates self-directed learning. Similarly, while most dimensions of heutagogy showed no significant variation based on locality, rural and urban students differed in explore, connect, and total heutagogy scores. This suggests that access to resources and digital environments may influence how students from different localities engage in autonomous and connected learning. With respect to digital skills, no significant gender differences were found in most dimensions except information navigation, creative skills, and the overall digital skills score, where female students outperformed male counterparts. This suggests a growing parity in digital literacy between genders, although differences in creativity and information-handling capacity persist. Differences based on locality were found in information navigation and creative skills, with urban students scoring higher likely due to greater exposure to digital environments and educational infrastructure. These findings align with existing research suggesting that heutagogy fosters digital competence through self-reflection,

learner autonomy, and adaptability. The observed differences highlight the need to address digital inequities and enhance heutagogy opportunities across different student demographics.

VII. CONCLUSION

The study concludes that heutagogy approaches have a meaningful relationship with the development of digital skills among undergraduate students. While overall gender and locality do not significantly influence most dimensions of heutagogy and digital skills, specific areas like explore, information navigation, and creative skills show notable variations. This highlights the importance of integrating self-determined learning practices in higher education curricula, especially to support diverse learners in enhancing their digital competence. Institutions should consider providing targeted interventions and support systems particularly for students from rural backgrounds to bridge the digital divide and encourage heutagogy engagement. Future research could expand this study across a wider geographic region and include qualitative methods to gain deeper insights into students' heutagogy experiences.

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