Navigating English Learning via Heutagogical Approaches in Self-Directed Learning with Technology

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Abstract

Technology has created a demand for new learning methods in education, such as e-learning, blended learning, and flipped learning. Self-directed is one of the new learning approaches that functions primarily based on technological learning mediums. With the advent of technology, present-day learners can access several new learning mediums that expose them to language learning resources. This accessibility motivates the learners to choose the content, manage their learning activities, and assess what they learn with the support of technology. This study designs a tech-driven teaching-learning methodology by blending SDL with heutagogy and further aims to discover how much technological learning mediums help students in SDL. It also emphasizes the role of technology in developing SDL as a heutagogical approach to learning several components of the English language. A survey was conducted among the first-year engineering students of Anna University to collect data on using learning media in SDL regarding English Language Learning. Findings reveal that most students prefer technological learning mediums to learning by themselves. It also leads to the recommendation that students create awareness about SDL as a learning system that will help them promote self-paced learning.

Keywords: Self-Directed Learning, Technology, Heutagogy, English Language Learning

1. Introduction

According to Won and Kim [1], "Self-directed learning (SDL) is a method of instruction in which students take charge of their learning by choosing how and when" to learn. (p.1) Technology can significantly support self-directed learning, especially when learning a foreign language like English. A heutagogical approach strongly emphasizes self-determined learning, in which students establish their objectives, choose their sources, and assess their learning results. "Learning in the 21st century has seen varied pedagogies pitching into the existing ones due to the technological alteration in the education system. This technological influence in the educational field leads to new learning platforms such as e-learning, self-learning, m-learning, flipped learning, autonomous learning, collaborative learning, and blended learning" [2]. These learning methods challenge the traditional education patterns, where smart-board and PPTs gradually replace chalk and talk methods. Likewise, pen-and-paper examinations are slowly being replaced with online testing systems. Although technology plays a crucial part in implementing all these learning mediums, it is welcomed mainly because of the factors such as time management, accessibility, and portability that facilitate the entire learning process.

Learning mediums such as books, magazines, libraries, and teachers are vital in impacting education and facilitating desired outcomes. Today, with the proliferation of technological inventions, learners can choose their learning medium [3]. The advent of electronic gadgets increases choosing technology-mediated learning methods, creating a digital environment for learners. The technology involved web-based learning mediums such as educational websites (like Coursera, Khan Academy, Udemy), Blogs, Skype, and Facebook; mobile applications such as note-making apps, mobile dictionaries (offline and online), and other learning apps form the basis for the digital learning environment.

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With this technology-driven pedagogical grounding, this study recognises SDL as one of new learning methods driven by technology. It also proposes a model of extending SDL as a heutagogical system for making it an organized learning method. The study also determines to what extent students use technological learning mediums to learn English through SDL. Furthermore, it also interprets and emphasizes the importance of technology in developing self-directed learning as a heutagogical approach for learning specific components of the English language.

2. Literature Review

2.1. Self-directed learning

The term' SDL is a "process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources for learning, choosing and implementing learning strategies, and evaluating learning outcomes" [4]. According to Schweder and Raufelder [5], “Self-directed learning is an instructional strategy where the students, with guidance from the teacher, decide what and how they will learn” (p.2). Self-directed learners are motivated, persistent, independent, self-disciplined, self-confident, and goal-oriented [5]. Through SDL, the learners can develop their critical thinking, domain-specific knowledge, and individual initiatives to manage their learning process.

Learning mediums play a significant role in Self-directed Learning [6]. In SDL, technological learning mediums support choosing learning materials and self-assessing what one has learned. Self-directed learning, through the technology-mediated learning environment, promotes learner autonomy in selecting the content according to the flexibility of the learners' needs. It also makes them feel like responsible learners and remains motivated throughout their learning process.

2.2. Language learning and SDL

Language learning need not necessarily be identified as a fixed parameter for everyone. It changes according to the requirements and purposes for which a learner needs the language. A teacher in a classroom cannot identify and concentrate on every learner's linguistic needs as it is heterogeneous. The difficulty in satisfying the learner's linguistic need can be solved through Self-directed Learning. Learners themselves can identify learning resources depending on the amount of linguistic proficiency they require. Here are some key findings of previous studies on SDL. Ruiz et al. [7], enlist the critical results of SDL, which are summarized below.

Self-directed learning is effective: Studies have shown that learners who take control of their education are more successful than those who rely solely on teachers or traditional classroom methods.

Motivation is crucial: Motivation is a critical factor in self-directed learning. Learners who are highly motivated to learn a language tend to be more successful than those who are not. Self-directed learners have specific characteristics: Successful self-directed learners tend to be highly organized, disciplined, and persistent. They can also set goals and monitor their progress.

Technology can support self-directed learning: Technology has made it easier for learners to control their learning. Online resources, mobile apps, and language learning software can provide learners with the tools they must learn a language independently. Language learning is a lifelong process: Learning a language is not a one-time event but a lifelong process. Successful language learners understand this and continue to study and practice even after achieving a certain proficiency level.

Context matters: The context in which language learning occurs can significantly impact the learner's success. Learners immersed in a language and culture progress more than those not.

Practice and feedback are essential: Language learning requires practice and feedback. Learners must practice using the language in real-life situations and receive feedback on their performance to improve.

Social interaction is essential: Language learning is a social activity. Learners who have opportunities to interact with native speakers and other learners tend to make more progress than those who do not.

Learners must take risks: Learners need to be willing to take risks and make mistakes to learn a language. Fear of making mistakes can hold learners back and prevent them from progressing. Language learning is beneficial for

cognitive development: Learning a language has mental benefits, such as improving memory, attention, and problem-solving skills.

2.3. Heutagogy

Heutagogy studies self-determined learning. The learners are independent and capable of determining their potential to learn something new from their novel experiences and can also manage their learning. Hase and Kenyon coined the word 'Heutagogy' to define self-learning as independent of formal teaching. Having its origin based on the Greek meaning 'Self', 'Heutagogy' is also identified as a learning strategy associated with a self-directed learning approach. In a Heutagogical system, the teacher offers help and advice for learning, but the learner is responsible for choosing the desired materials to negotiate the learning part. This approach is becoming increasingly popular in education, including English language learning. Here are some previous studies on heutagogical approaches to learning English. According to Hase and Kenyon [8] the reason for learning through SDL need not necessarily be centered on the need but on identifying the potentiality to learn in a new situation. Learners use their own and others' experiences and interaction with others as part of their learning resources. The growth in technological developments makes self-directed learning or Heutagogy even more effective. Narayan et al. [9], explored the effectiveness of a heutagogical approach in English language teaching, specifically in a blended learning context. The authors found that heutagogy can effectively improve students' motivation, engagement, and language proficiency. Kim and Cho [10], found that heutagogy can be a practical approach for promoting self-directed learning and improving language learning outcomes. These studies suggest that heutagogy can encourage learner autonomy, motivation, and engagement in English language learning. However, further research is needed to explore the effectiveness of heutagogy in different contexts and with varying learner populations.

2.4. Differences between SDL and Heutagogy

Researchers across the globe misunderstand the connection between SDL and Heutagogy. This misunderstanding is because there has been no significant development in self-determined learning since the concept was promoted in 2000, says Stewart Hase, Australian academic psychologist. In his article featured in the blog 'Heutogogy Community of Practice,' he clarified the difference between self-directed and self-determined learning. To him, self-directed learning is a subset of self-determined learning (i.e., Heutagogy). According to Jiang and Zhao [11], Heutagogy is the study of self-determined learning where "knowing how to learn" becomes the fundamental skill. On the other hand, self-directed learning (SDL) is something to do with "how we think about learning," which redefines Hase's perception of SDL as a subset of Heutagogy. According to an American Adult Educator, Malcolm Knowles, self-directedness is possible only among adults and differentiates the learning process between young and adult learners. This clarity in difference shows that SDL is directly proportional to Androgogy (adult learning). SDL and Heutagogy are two related but distinct concepts.

SDL is a process in which learners take responsibility for their learning, choosing what and how they learn, setting goals, and monitoring their progress. In SDL, learners actively participate in learning and may seek resources and support as needed. SDL can be seen as a continuum that ranges from teacher-directed learning to self-directed learning, with varying degrees of learner autonomy. Heutagogy, on the other hand, is a learning theory that emphasizes self-determined learning. In Heutagogy, learners take full responsibility for their learning, choosing what and how they learn, and defining their learning goals and evaluation criteria. Heutagogy is based on the principle that education should be driven by the learner's interests, passions, and needs, and that the learner should control the learning process. Thus, the main difference between SDL and Heutagogy is the level of learner autonomy and control over the learning process. While SDL involves learners taking responsibility for their learning, Heutagogy emphasizes learners' self-determination and control over their knowledge, including evaluating and assessing their learning [12].

2.5. Blending SDL and Heutagogy

"Amidst the various learning methods in the educational system, the digital era also contributes to technological learning methods as an add-on methodology to support learning. This study leads a step forward by connecting SDL and Heutagogy as an educational learning system" [13]. In SDL, the learners choose what and how they want to learn and through what means they manage and assess their learning. In Heutagogy, the same learning process is self-determined, and "knowing how to learn" is given prominence. Heutagogy, although it involves the role of the teacher

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as an instructor, is undoubtedly a learner-driven and learner-managed method of learning. Considering these individual factors of the two entities, this study designs a new model for extending SDL as a Heutagogical system.

Learners need not necessarily mean adult learners; instead, they should be self-determined learners capable of initiating their learning in their interest. The learning mediums they prefer are, to a more significant extent, driven by technology that can be identified as technological learning mediums such as mobile apps, video sites such as YouTube, File sharing devices such as Google Drive, and the like. With self-determined learners and technological learning mediums, SDL is promoted to the next level of a heutagogical system by including the role of a teacher as a facilitator. Since the system is self-directed and self-determined, where the learners manage the entire learning process, the teacher can easily facilitate it.

This study formulates a model for promoting SDL as a heutagogical system, where learners, technological learning mediums, and the teacher as a facilitator interconnect as shown in figure 1. Since the learners are already equipped with technological learning mediums, they can choose the content and materials available on the internet sources to initiate their learning process. Furthermore, they can use note-making apps or word documents to record what they have learned.

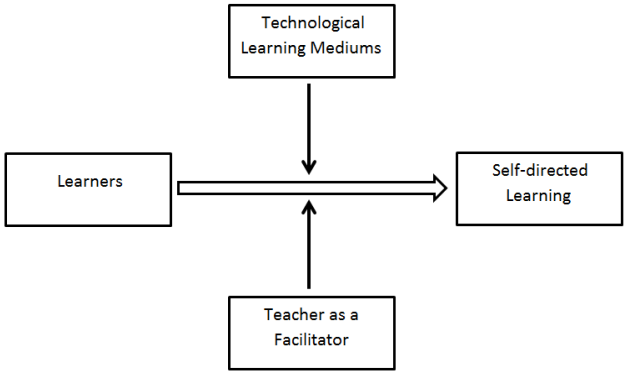

Figure 1. SDL as a Heutagogical System

Self-assessments can become easy with the readymade quiz software that already exists in the online platform, where the learner is also made aware of the result as soon as one finishes the test and submits the form. Therefore, the role of the teacher here is not to teach them but to assist them or facilitate them by providing necessary information on "how to learn." Again, it is the role of the teacher to make students aware of the 'process' involved in learning. Thus, the study promotes SDL as a heutagogical system where teachers, students, and the learning medium meet at an intersecting point to make the learning process practical and conducive to each learner.

2.6. Collaborating Materials, Methods, and Testing

The three significant elements of the learning process are materials, methods, and testing. It is even more critical to identify what kind of material and methodology a learner might need to update his knowledge on and how effective should be the testing pattern. Identifying suitable materials, methods, and testing patterns for any learning is essential. In a heutagogical approach, all three significant elements benefit the learners implicitly and explicitly in the learning process. "When SDL is seen as a heutagogical system, it is the responsibility of the learners to choose what and how they want to learn. In this learner-centered and learner-managed system, the teacher's burden can be reduced, provided the teacher knows the system and guides the learner according to it [14]. Heutagogy, the learner-driven learning process, directly involves the learners choosing materials, methods, and how they assess themselves, which in turn collaborates the learning elements to come together. By doing so, the learner learns "how to learn," which is supposed to be the fundamental skill behind heutagogy.

2.7. Role of a Teacher

The teacher, being the facilitator, should let the students know about the various resources and the testing patterns available to make them think independently in choosing the content, materials, and assessment method. With self-assessment as a natural element in SDL, teachers need not separately assess the students based on what they have

learned [15]. Still, teachers can suggest various assessing tools and simplify the self-assessment process for the students. It is equally vital for a teacher here to make students aware of "how to learn" (heutagogical process) and make them "think about learning" (SDL process). To sum up, teachers should inform students about the benefits of diagnosing, choosing the content and materials, identifying their learning objectives, and taking the initiative to learn. However, learners should decide what and how they want to learn and how and why they should assess their learning.

2.8. Heutagogy and English Language Learning

Regarding language learning, the parameters of measuring an individual's knowledge differ. Here, the Heutagogical learning process keeps students aware of their language proficiency. This can be implemented when a teacher facilitates learning by making an individual aware of the process rather than the product [16]. In language learning, the teacher should also make the students realize the importance of what they must learn to develop language proficiency. The curriculum must be redesigned according to the heutagogical system considering the pace of technological innovation and the changing structures of communities and workplaces. While the students are learning, the teacher can facilitate them by clarifying their doubts. After the learning has undergone, the teacher can facilitate a discussion among the students where 'knowledge sharing' can occur. Finally, to assess their learning, the teacher should let them know the assessing methods, available resources, and the importance of evaluating their learning. Since self-assessment is a learning process, it makes the students not repeat the errors and mistakes committed by them.

2.9. Seminal studies in SDL

Since the late 1980s, Self-directed learning has become an approach to learning anything. More specifically, while retaining the English language, this approach is helping the learners a lot in the digital era, where plenty of resources are available without bias to teachers and students. An experiment was carried out to enhance SDL students' motivation and performance [17]. The research took advantage of modern technological methods to effectively disseminate instructional techniques as extra reading material. The results show that motivation and performance can be improved in an SDL setting by employing well-established initiatives mediated by technological means. Chun and Abdullah [18], explored the impact of self-directed learning on learners' reading comprehension proficiency. 164 females Austrian EFL learners with upper-intermediate and advanced levels served as the study's samples. The experiment's findings show a considerable disparity between the mean scores for self-directed learning and teacher-directed learning, with the latter coming out ahead of the former.

Blaschke [19], has discussed the future of SDL. The prediction that all learning will have the foundation of the principles of SDL by 2020 came true. The researchers discuss the growing significance of video recording of lectures that become podcasts for playback on PCs and portable media players, which can become a new format of SDL called Flip Teaching (FT). This method encourages the students to learn and practice the topic in the classroom. This practice can reduce teachers' burden and make every student learn and understand the content individually. In a country like India, where technology reaches students rapidly, self-directed learning can be merged with regular teaching. This study emphasizes the emergence of a self-directed approach among learners using the technological learning media to learn, manage, and assess their English language learning independently. Based on these findings, a new scope and method of learning English can be introduced in the classroom to benefit both the teachers and learners. According to Beseghi [20], Teachers can reduce the burden of teaching a large class, concentrating on every student, and students can learn every element of the language independently, taking their own time and assessing what they learn through SDL with the help of technology.

3. Method

The use of technology in SDL has become increasingly popular recently. This survey explores the use of technology in a Heutagogical approach to learning English in an L2 context. Participants in this survey will include ESL learners who have engaged in self-directed learning using technology, such as online resources, mobile apps, and language learning software. The survey will be conducted online and will consist of close-ended questions. The open-ended questions will ask participants to describe their experiences with technology in SDL and how they have used technology to learn English. The survey will also include questions about the participants' English proficiency levels, motivations for learning English, and attitudes toward self-directed learning and Heutagogy.

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The results of this survey will provide valuable insights into the use of technology in SDL from a Heutagogical perspective. This information can be used to improve the design and implementation of technology-based SDL programs for ESL learners. In addition, the survey results can develop best practices for using technology in SDL in other educational contexts. The following steps were employed in the study. Initially, the research question was clearly defined, and the hypothesis was formulated. Third, the target population was determined. Followed by the survey instrument was designed. After discussing with the experts, the survey instrument was refined and administered to the target population. After helping with the survey, the data was collected and organized for analysis. The data was coded using the statistical software program SPSS version 26. The data was analyzed. Finally, the survey's findings were reported clearly and concisely, highlighting the most important results and their implications for educational practice. The steps involved in the study are shown in figure 2.

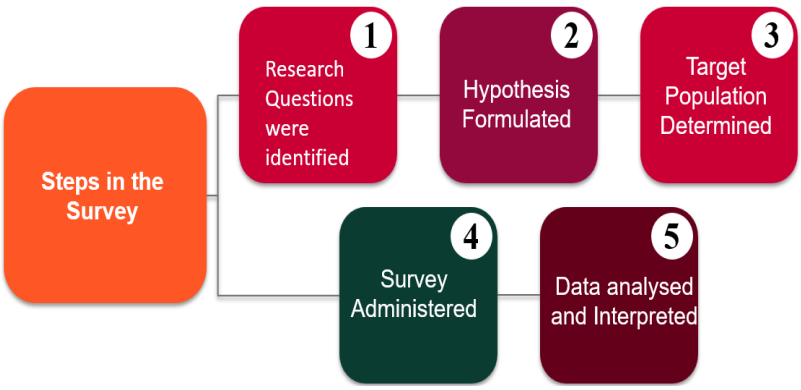

Figure 2. Steps Involved in the Study

Research questions:

Do students select, manage and assess while they learn English?

Do technological learning mediums help them in learning English?

3.1. Hypothesis

Students prefer technological learning mediums to select, manage and assess their language learning components to independently self-direct and regulate the learning process. Based on the topic and context provided, a research hypothesis was formulated:

"Using technology in a Heutagogical approach to self-directed learning can significantly improve English language proficiency for ESL learners."

This hypothesis suggests that technology can enhance self-directed learning in a Heutagogical approach, improving English language proficiency. It implies that learners who engage in self-directed learning using technology can achieve more tremendous success in learning English than those who rely solely on traditional classroom instruction or teacher-directed learning. The hypothesis is consistent with previous research findings that technology can support self-directed learning and enhance language learning outcomes. Of course, a research hypothesis needs to be further refined and operationalized, and the specific methods and measures to test the hypothesis would need to be identified. Additionally, potential limitations and alternative explanations for the findings would need to be considered and addressed.

3.2. Determination of Target Population

A simple random sample is drawn from each stratum to obtain a representative population sample. The purpose of stratified random sampling is to ensure that the model includes a proportional representation of each subgroup in the population and to reduce the sampling error or variability that may occur when using a simple random sample. Sixty students from three branches of Engineering participated in the study. Thirty-eight were male, and 22 were female students. The students were between 18 to 20, and they were at the B2 level. All the learners spoke English as a second language.

3.3. DATA COLLECTION

A questionnaire survey was conducted among 60 first-year engineering students from different departments studying at Anna University (CEG campus) who formed the study's sample. The questionnaire's objective was to collect data on the use of learning mediums the students use in Self-directed learning for learning the English language. The questionnaire consisted of 20 questions, and the types of questions were closed-ended Dichotomous and multiple-choice close-ended questions. 'Google Forms' was used as a tool to design the questionnaire and collect responses from the sample. The questionnaire link was sent to the respective students, and the form accepted answers until the response count reached 60, determining to be the sample for this study.

3.4. Analysis and Interpretation

Technological learning mediums make self-directed learning more effective and allow learners to be independent in their learning process. Present-day learners are aware of technological gadgets and know how to use them constructively. Smartphones are readily available, and almost every student possesses one due to their affordability and varied usage. Likewise, E-mail ID has become a necessary medium in both professional and personal life. The Google Forms survey shows that all the students possess a smartphone and an E-mail ID and asserts that smartphone usage and E-mail ID have become necessary.

In this digital age, Social Networking Sites (SNS) and other social media tools, such as blogs, are open to any number of users across the globe. Out of the 60 responses recorded, 46 students have their own Facebook account resulting in 76.7% of the sample, and 23.3% of students do not have a Facebook account which is 14 out of 60. Based on this data, it is evident that most of the sample uses Facebook and is aware of SNS.

Unlike Facebook, the awareness of owning and accessing a blog is uncommon among students. This is evident from the fact recorded in the survey that 88.3% of the respondents do not own a blog. It is also equally important to note that 11.7% of respondents own a blog. This shows that there is at least minimal interest among students in publishing their write-ups in their blogs. The survey also provides the information that 96.7% of the sample access Facebook and E-mail on their mobile phones (figure 3). It is observed that the usage of blog owners is less compared to the use of Facebook and E-mail ID users, acknowledging the shift in digital literacy from static to dynamic spaces. Blog posts are usually less interactive compared to Facebook posts. Online courses are in-demand tech learning mediums that come into the hands of the internet. The awareness of online courses among students resulted positively, with 85% of the sample having existing knowledge about online courses.

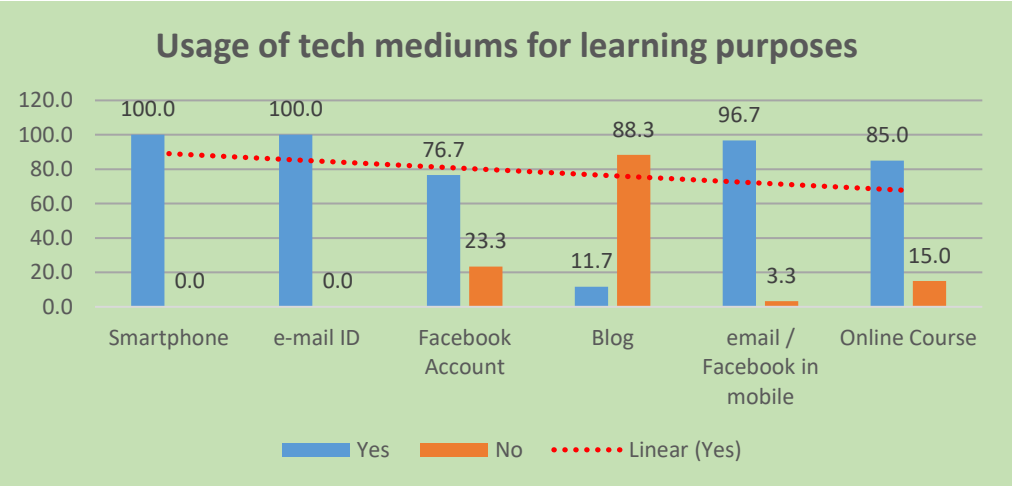

Figure 3. Usage of tech mediums for learning purposes

The gathered data answers the first part of this research hypothesis and ascertains that student use technology for learning purposes. However, the primary focus of this study is to ensure whether students use these technological mediums to learn English and assess their learning. With 73.3% of the sample preferring to read e-books and 88.3% using mobile dictionaries, it is evident that students are comfortable using technology as their learning device. This data leads to further inquiry on students' learning devices to learn vocabulary, meaning, grammatical components, and

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productive usage (speaking & writing). Multiple choice, closed-ended questions with all possible answers were asked in the questionnaire to collect data on these aspects.

A learner can rely upon various sources to learn new words. The study also investigated the learning sources preferred by students of this generation to learn vocabulary. The questionnaire result proves that students prefer mobile dictionaries and vocabulary applications to a great extent compared to teachers and friends. 15.4 per cent of the respondents also prefer learning new words from other tech mediums like e-books, videos, and movies (figure 4).

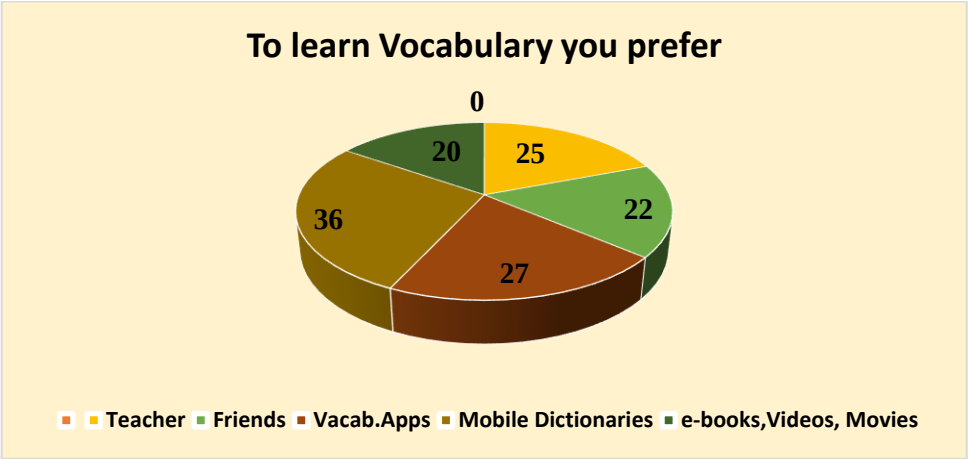

Figure 4. To Learn Vocabulary

To learn new vocabulary, 20.8 per cent of the sample prefers using mobile applications such as vocabulary and thesaurus apps. The model also suggested using e-books, videos, movies, and Google as other learning mediums to learn vocabulary. This data reveals that students are aware of their preferences for technological devices apart from the researchers' options. In addition, the overall data shows that students on a larger scale prefer technology-mediated learning devices to learn vocabulary.

To know the meaning of a word, 29.2% of the sample prefers using the internet, 25.8% use offline mobile dictionaries, and 14.2% rely on printed dictionaries (Table 1). This data too proves that students are comfortable with technological devices to learn due to their quick accessibility.

Table 1. To Know the Meaning of a Word You Prefer

Description	Responses N	Percent	Percent of Cases
Dictionary (Print)	17	14.2%	48.6%
Internet	35	29.2%	100.0%
Vocabulary Apps	27	22.5%	77.1%
Mobile Dictionaries	31	25.8%	88.6%
Guessing upon context	10	8.3%	28.6%
Total	120	100.0%	342.9%

Contrary to this data, for learning grammatical components like Tense, Adjectives, Active and Passive Voice, and Direct and Indirect speech, 45.1% of students prefer teachers to a greater extent. Respondents also prefer tech mediums like the internet (30.8%) and mobile applications (13.2%). The peer reliability is significantly less for learning grammar components, with only 8.8% of the sample preferring to learn from their friends. Since both internet and mobile applications come under technological learning mediums, the sum of which comes to 43% and is close to the scale of students preferring teachers to learn grammar (Table 2).

Table 2. To learn Grammatical Components (like Tense Adjectives, Active and Passive voice, and Direct and Indirect speech)

Description	Responses N	Percent	Percent of Cases
Teacher	41	45.1%	100.0%
Friends	8	8.8%	19.5%
Internet	28	30.8%	68.3%
Mobile Apps Grammar	12	13.2%	29.3%
Grammar Books	2	2.2%	4.9%
Total	91	100.0%	222.0%

Similar to the above data, the percentage of students (36% of the sample) preferring to learn English usage (speaking and writing) through teachers is more in number. The preference for other options such as the internet, mobile educational apps, and friends is comparatively less than the number of students who prefer learning the usage from their teachers. When adding the percentages of tech tools such as the internet and mobile educational apps, it is evident that 46% of students feel comfortable using tech mediums to learn, which precedes the percentage of students preferring teachers (Table 3). Apart from the above options the researchers gave, the respondents have also suggested books and movies as other learning mediums to learn their usage. As they mentioned, movies are excellent resources for learning to speak English, especially when subtitles are offered as prompts. Movies also help them learn new contextual words, phrases, pronunciation, and intonation.

Table 3. To learn English usage (Speaking & Writing)

Description	**Responses N**	**Percent**	**Percent of Cases**
Teacher	36	36.0%	100.0%
Friends	16	16.0%	44.4%
Internet	32	32.0%	88.9%
Educational Apps	14	14.0%	38.9%
Grammar Books	2	2.0%	5.6%
Total	100	100.0%	277.8%

In Self-directed Learning, the three crucial components are choosing the learning material, managing the study process and self-assessing the learning. Students can select their learning materials and cross-check for the reliability of the resources with various technological tools such as academic and educational websites and search engines such as Google Scholar. Out of 60 responses, 76.7% of the sample say they choose their learning materials. Among them,34.8% of students prefer materials from internet sources, 24.7% from books, 16.9% from e-books, and 12.4% from mobile apps (Table 4). This result shows that learners have diverse methods in choosing their learning materials, which offers increased resources for them to decide on their own. Now that students are choosing their learning materials to promote SDL as a heutagogical system, the research recommends that teachers act as facilitators to direct students in selecting suitable material to better their learning.

Table 4. Choosing Own Learning Materials

Description	**Responses N**	**Percent**	**Percent of Cases**
Books	22	24.7%	71.0%
E-books	15	16.9%	48.4%
Internet	31	34.8%	100.0%
Mobile Apps	11	12.4%	35.5%

Library	10	11.2%	32.3%
Total	89	100.0%	287.1%

As the research focuses primarily on English language learning, the questionnaire survey also observed the devices students use to note the new words or phrases they come across while learning. Table 5 summarizes the overall response recorded by the sample to determine the choice of the tool used for note-making. Of the 60 respondents, 32 students, 53.3% of the model agreed to make notes of new words or phrases. Concerning the devices used for noting down the new terms, 31.9% use note-making apps, 8.5% use the conventional method of pocket-dairy,19.1% use notepad, and 38.3% choose the screenshot method to note down the new words they come across. Additionally, bookmarks and sticky notes are the other suggestions the respondents gave. This observation asserts students' effort to record their learning, which becomes an essential aspect of self-directed learning. The learning record forms a self-made portfolio for students to refer to and relearn the words in the future. We can understand how self-directed learning makes students consistent and determined, achieving discipline in learning.

Table 5. Devices for Recording New Words When One Learns.

Description	Responses	Percent	Percent of Cases
	N		
Note -making Apps	15	31.9%	83.3%
Pocket dairy	4	8.5%	22.2%
Book mark	1	2.1%	5.6%
Note – Pad	9	19.1%	50.0%
Screenshots in Mobile	18	38.3%	100.0%
Total	47	100.0%	261.1%

Self-evaluation is the most critical aspect of Self-directed learning. With the help of technological learning mediums, self-assessment becomes easy, and it can vary from time to time for each individual. According to the data obtained, 63.3% self-assess the language components they learn, highlighting the significance of awareness among students in self-assessing what they have learned. This also implies that if SDL becomes an effective heutagogical system, with teachers' intervention as facilitators, self-assessment awareness will increase rapidly among students. The survey also records the medium through which the learners self-assess themselves. As per the data from the survey,28.6%of students self-assess their learning through internet sources, 20.2% prefer assessing through friends, and 11.9% through teachers. The survey also includes data on what motivates the students to select SDL (Table 6). Interestingly, the data collected revealed the impact of technology among students, with 43.5% of the sample identifying internet sources as their primary motivation. Students use technological devices to a greater extent to select, manage, and assess their language learning components, proving the hypothesis that they prefer technological learning mediums to self-direct and regulate the learning process independently.

Table 6. Factors Motivating Students to Learn on their Own

Description	Responses	Percent	Percent of Cases
	N		
Teacher	21	24.7%	56.8%
Library Resources	9	10.6%	24.3%
Internet Sources	37	43.5%	100.0%
Mobile Apps	11	12.9%	29.7%
Online Courses	7	8.2%	18.9%
Total	85	100.0%	229.7%

4. Result and Discussion

Based on the survey conducted among first-year engineering students, it is evident that most students are exposed to technology and use technological learning mediums to learn by themselves. The data also proves they are already aware of using technological learning mediums to learn English. If SDL is introduced as a learning system in academics, the burden of the teachers to teach a large class and concentrate on every individual can be reduced. As facilitators, the teachers can help students achieve the goal of learning the individual needs of learners in language learning. Learners could also become responsible for what they learn. In this direction, SDL functions as a heutagogical approach to learning where teachers become instructors who support student learning and an external force to motivate them to self-assess what they learn. Considering the tech-savviness of current -generation students, this study also recommends that language teachers suggest the right tech tools and materials for students to facilitate authentic learning. Students should also be encouraged to enroll in online courses on digital learning platforms such as NPTEL and SWAYAM. This way, the heutagogical approach helps in shaping the student into a responsible and independent learner who gradually develops an inquisitive taste toward fulfilling one's learning needs. Teaching through this approach creates many new methodologies such as flipped, blended, and online learning, which can remain lifelong learning platforms. Here are some ways in which technology can support a heutagogical approach to learning English:

Numerous online platforms, such as Duolingo, Babbel, and Rosetta Stone, offer self-directed language learning courses. These platforms allow learners to set their own pace and choose the topics they want to learn. Language learning apps: Language learning apps such as Memrise and Lingodeer offer a gamified approach to language learning, making it more engaging and fun. These apps use spaced repetition and interactive activities to help learners acquire language skills. Online language communities: Many online communities, such as language exchange websites and forums, allow learners to connect with other language learners and practice their language skills. For example, Tandem and HelloTalk are language exchange apps enabling learners to communicate with native English speakers to practice speaking and listening. Many platforms offer online tutoring and coaching services, such as iTalki and Preply. These platforms allow learners to find a tutor or coach who can help them achieve their language learning goals. Countless online resources are available for language learners, such as language learning blogs, podcasts, and YouTube channels. These resources can provide learners with additional support and motivation. In conclusion, technology can be a powerful tool to support self-directed learning of English. A heutagogical approach to learning emphasizes the learner's autonomy and self-determination, and technology can help facilitate this by providing learners with a wide range of resources, opportunities, and support.

5. Conclusion

This study aims to discover to what extent new learning mediums driven by technology help students in self-directed learning. The survey findings prove that students use technological learning mediums more than others. These findings further support the concept of SDL to be developed into a heutagogical approach to learning English with the aid of technology. The future of education will be primarily based on the individual need of the learners and can be achieved easily using technological learning mediums. With the growing speed of digitalization, the learning environment changes according to the learners' needs faster and more reliably through self-directed learning, which facilitates learning the way the learners want it to be. To conclude, students use technological learning mediums and get accustomed to this learning environment quickly, which helps them to learn and assess different components of the English language, like vocabulary and usage, at their own pace through a self-directed learning approach. Hence, self-directed learning as a heutagogical system is recommended to be implemented in higher education institutions to promote learner autonomy, to make one a responsible cum independent learner, and to address their customized educational needs.

There are potential directions for future research in technology in SDL using a Heutagogical approach to learning English. Here are some niche areas: The effectiveness of specific technology tools: Although many language learning apps and online resources are available, it is essential to identify which tools are most effective for enhancing self-directed learning in a Heutagogical approach. Future research could explore the benefits and limitations of various

technology tools for various aspects of language learning. A Heutagogical approach can be applied for testing technology-based models of instructional design.

The role of social interaction in technology-supported SDL: Although technology can provide learners access to learning resources and tools, social interaction is also meaningful in language learning. Future research could explore how technology can support social interaction among learners and with native speakers and how such interaction can enhance self-directed learning in a Heutagogical approach.

The impact of learner characteristics on technology-supported SDL: Not all learners may be equally comfortable with using technology for self-directed learning, and learner characteristics such as age, gender, culture, and prior experience may influence the effectiveness of technology-supported SDL. Future research could explore how learner characteristics affect the use of technology in self-directed learning in a Heutagogical approach. While this study focuses on English language learning, the results may have implications for other languages and educational contexts. Future research could explore the effectiveness of technology-supported SDL using a Heutagogical approach in different language learning contexts and with diverse learners.

The long-term impact of technology-supported SDL: While technology can enhance self-directed learning in the short term, it is essential to consider the long-term effect of such learning on learners' language proficiency and ability to use the language in real-world contexts. Future research could explore the extent to which technology-supported SDL in a Heutagogical approach can lead to sustained language learning outcomes over time.

6. Declarations

6.1. Author Contributions

Conceptualization: Z.D.X. and X.X.; Methodology: X.X.; Software: Z.D.X.; Validation: Z.D.X., X.X.; Formal Analysis: Z.D.X., X.X.; Investigation: Z.D.X.; Resources: X.X.; Data Curation: X.X.; Writing Original Draft Preparation: Z.D.X. and X.X.; Writing Review and Editing: X.X. and Z.D.X.; Visualization: Z.D.X.; All authors have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.3. Funding

The author would like to express gratitude to the PMI for their support in this research.

6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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