Promoting Learner Autonomy Through Informal Digital English Learning in India

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ABSTRACT:

This study analyses the learner autonomy in English language learning, through digitally mediated informal practices in Indian classrooms. Post-pandemic, the digital tools are used in large scale replacing the traditional ones that remained central in most of the Indian classrooms. Although they have not been replaced completely, the integration of modern digital tools is gradually reforming English learning. The learners are engaged in informal learning by using digital tools like Mobile applications, online interactive platforms, language games and digital whiteboards and e-books in the modern days. This study is rooted in Self-Determination Theory (SDT), examining how integration of informal digital learning promotes autonomy that enhances motivation, self-regulated learning and personalized learning methods. The Constructivist Learning Theory strengthens the study by emphasizing how learners actively build knowledge through informal resources like digital tools, rather than relying completely on teacher-led instruction. A structured questionnaire was distributed to high school learners aged 16–18, to evaluate their informal engagement with digitally mediated learning practices. The analysis demonstrated that learners who constantly employed these informal strategies demonstrated higher autonomy practices compared to the learners who depend purely on classroom instruction (formal learning). The findings strongly suggest that integrating informal digital approaches with formal teaching can create autonomous learning practices, enhancing language proficiency. The study highlights the different strategies in developing opportunities that promote autonomy, also suggesting the alternative methods that can be used to support persistent learner engagement and effective English language acquisition.

Keywords: Learner Autonomy, Informal Learning, Digital Tools, English Learning, Self-Determination Theory, Constructivism

1. Introduction

The formal learning refers to structured, direct instruction that usually occurs in classrooms, with fixed curriculum, objectives and assessment. It highlights vocabulary exercises, grammar rules and controlled practice which is common in Indian classrooms. However, informal learning takes place outside the classroom through digital platforms, everyday interactions, community activities, peer conversation, storytelling etc (Zadorozhnyy, 2025). It is learner-centred, context-based, and focuses on fluency, practical use and communicative competence. The formal learning methods builds foundational knowledge whereas the informal learning allows learners to apply and strengthen language skills in real-world situations. The English language can be learned through several informal methods however, this paper specifically focuses on digital tools as means of enhancing language skills enabling learner autonomy. These digital tools provide self-directed opportunities for vocabulary, listening, reading, and writing practice beyond the classroom.The leaners who use digital sources as a medium or mode of learning, for English language acquisition are known as informal learners. However, the learners who follow the formal method of learning like syllabus based, textbook oriented, teacher-centred are known as the formal learners. The empirical study proves that the informal learners execute higher learner autonomy than the formal learners which explains the objective of this study.

The informal learning through digital tools plays a major role in developing learner autonomy by creating opportunities for English language acquisition outside the classroom. (Wu 2025; Xu et.al. 2025). In the present days, learners learn credible English language by engaging in informal practices such as online discussions, participating in social networks and watching English Media promoting creativity and independent exploration (Lai, 2021). The access to mobile applications, social platforms, and gamified environments motivate learners to set goals, monitor their progress, and seek feedback at their own risk (Benson et.al. 2020). The learners become active participants in knowledge construction using informal digital learning strategies (Piaget, 1973; Chen 2020). The Digital integration promotes informal learning among English learners enhancing autonomy conditions identified in Self-Determination Theory. (Deci & Ryan, 2017; Lai, 2021). Thus, the integration of digital tools transcends classroom instruction but essentially transforms how learners' experience, control, learn and sustain their English language development, establishing it as a foundation for learner autonomy (Liu and Gu, 2021; Liu et.al. 2023).

1.1 The role of Learner Autonomy in English Language Acquisition

The autonomy refers to the ability of learners to take accountability for their own learning process, including ideas and decisions about how, what and when to study. The learner autonomy is essential in English language acquisition because teaching/learning hours alone is typically insufficient to foster proficiency in listening, speaking, reading, and writing (Benson, 2017). Learner autonomy provides substantial advantages for language acquisition in different ways when the learners lack resources and materials. It emerges at the crucial point ensuring meaningful learning progress (Lee, 2020; Rahimi and Zhang 2021). Therefore, the learners apply these strategies independently, practise continuously and adapt learning both in formal and informal environments, to attain their goal of language acquisition with greater confidence and proficiency (Lai, 2021).

This study highlights that autonomy encourages deeper improved communicative competence, deeper vocabulary retention and stronger problem-solving abilities as learners actively engage in knowledge construction rather than passively receiving it (Benson et.al 2020). The exam-driven instruction and teacher-centred approach practised in Indian schools often limits communicative practice, causing fear and discouragement among the English learners. However, the autonomy supported by informal digital methods encourages learners to explore English for academic, personal and social purposes (Deci & Ryan, 2017). Thus, learner autonomy is not simply an idea but a

practical need for improvement and betterment of English Language acquisition. The major elements like Motivation, Self-regulated learning, personalized learning stands as a crucial factor or serve as the aspects in developing learner autonomy enabling English language acquisition. This paper explores how each of these elements contribute in shaping autonomous learners to attain their goal.

1.1.1 Motivation

The learners engaged in autonomous driven environment, are influenced not only by grades or rewards but also by an internal desire to improve their skills thereby attaining their goals. According to Self-Determination Theory, when learners feel the control over their choices, their motivation increases, leading them to take part more deeply in language learning process (Deci & Ryan 2017). For example, learners who choose their own English media or digital resources show greater perseverance and prolonged interest compared to those limited by fixed classroom activities (Lai 2022).

1.1.2 Self-Regulated Learning (Responsibility for their learning patterns)

The main purpose of autonomy is to take ownership of their learning ideas, showcasing independency in their progress by monitoring outcomes, setting goals and reflecting on their strategies. The learners themselves actively select topics of interest, practise scheduling, examine and evaluate their own strengths and weaknesses without intervention. This study demonstrates that learners who track their progress through self-assessment or involve in such independent activities show self-regulation skills, making them less dependent on persistent teacher direction (Rahimi & Zhang 2021).

1.1.3 Personalized Learning (Experimentation in choosing different means for better outcome)

The learner autonomy encourages the learners to experiment with communication strategies including vocabulary, sentence formation without fear of failure (Soyoof, et.al.2023; Wu, 2025). The informal digital platforms, such as discussion forums, online platforms provide safe zone for learners to test their language skills in different contexts (Lee 2020). This experimental learning process encourages confidence, which is essential for communicative competence and fluency development in English language acquisition (Benson 2017). Autonomous learners frequently show creativity by creating original content like role plays, blogs and digital stories that help them learn English Language beyond textbook exercises. The Constructivist approach claim that creativity develops when learners are free to build meaning from personal experiences and digital resources rather than recalling learned information and memorized knowledge (Piaget 1973; Schunk 2019). This autonomy helps in designing their projects, academic activities and enable understanding of ideologies, critical thinking, and innovative factors that is regarded as an outcome after hard work.

1.2 Status of English Language in India

In India, the English language occupies a unique position as a second language acting as a medium for professional communication, global interaction and higher education. The English language is systematically, taught across India through different means (Bhatia & Rani, 2019). However, the proficiency of learners differs widely due to regional, infrastructural and socio-economic differences (Rao & Kumar, 2021). The Indian classrooms often rely on traditional learning, grammar translation, and textbook-based methods, that hinders learners' opportunities for valid communication and critical engagement with the language (Suresh, 2020). The recent studies indicate that rate of learners using informal learning practices are gradually increasing from watching English-language media to participating in online courses just to improve their skills. For example, the introduction of robotics, coding and AI into the curriculum in Telangana (state in southern India) aims to encourage problem-solving skills and critical thinking indirectly supporting language development (Times of India, 2023). As mentioned, this practise became quite common after the pandemic as all school activities became online for a period of time (Fan and Wang, 2023; De Wilde et.al. 2023).

The learners felt comfortable learning online using a number of sources that is quick and time saving (Suresh, 2020). These practices enabled learners to experiment further and helped them in developing problem-solving strategies, and build communication skills in different contexts (Fan and Wang 2023). The digital tools, specifically offered self-paced and flexible opportunities that are not limited by classroom curriculum or schedules. The learners felt free to login and logout resources whenever they felt comfortable (Godwin-Jones, 2018). However, differences in digital access persist, despite these advancements. A report from Madhya Pradesh emphasizes that only 0.9% of government schools have digital libraries, and 11.6% are structured with smart classrooms, demonstrating gaps in infrastructure that limits the widespread integration of digital learning tools (Times of India, 2023).

This study intends to examine how autonomy emerges in real learning situations by focusing on informal digital-mediated learning among high schoolers in India. Also, this study seeks to provide validation on which strategies genuinely enhance learner independence and proficiency of language, offering practical knowledge for learners to balance organized learning with autonomous learning opportunities. The impact of English language acquisition among the learners is provided through empirical study by analysing the relationship between various strategies and theoretical constructs of SDT and Constructivism. This offers learners an insight into the self-directed and context-rich learning experiences.

2. Theoretical Framework

This study relies on Self-Determination Theory (SDT) and Constructivist Learning Theory, which collectively offer a perspective to understand the development of learner autonomy in English classrooms. The Self-Determination theory argues that learners' integral motivation is inspired by the contentment of three psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2017). In relation to this study, digital-mediated informal learning activities like watching English videos, using language applications and engaging in interactive online platforms allow learners to practise control over how and what they learn, thereby fulfilling their need for autonomy (Li, 2023). The factors like successful task completion and positive feedback through these activities enhance their sense of competence (Xiu et.al. 2025). Moreover, interactive platforms such as peer-learning platforms, online discussion forums and collaborative tasks, encourage a sense of relatedness by enabling learners to connect, build and share various experiences through supportive learning communities with teachers and peers, that strengthens their intrinsic motivation (Wang & Chen, 2024).

Constructivist Learning Theory highlights that learners actively develop knowledge through engagement with valid experiences (Piaget, 1973). This aligns with the study's focus on informal digital learning, where learners encounter English in real-life contexts rather than only through textbooks (Liu et.al. 2023). For example, online discussions or task-based activities provide circumstances where learners experiment with language, communicate, and develop problem solving skills actively constructing understanding (Lai, 2021).

Therefore, by integrating SDT and Constructivism theory this study explains why learners who involve in informal digital-mediated learning demonstrate greater motivation, self-regulated learning, and practical language skills through personalised means. It also justifies the study's research design analysing how these learning strategies support learner autonomy and improve English language proficiency among high school students in India.

3. Strategies enabling Learner Autonomy in English Language Learning

To implement theoretical insights into actionable practical context, several strategies are suggested that can effectively facilitate learner autonomy in English language learning. The key approach namely the informal integration of digital tools is explained in detail. This particular approach plays a major role in promoting learner autonomy in English language learning by examining the key psychological needs as autonomy, competence, and

relatedness providing opportunities for motivational, self-directed engagement and personalized learning experiences.

3.1. Informal digital tools enhance Motivation

Motivation is crucial to autonomy, and the digital tools provide opportunities for both intrinsic and extrinsic motivation. The marks, levels, points known as gamified features provide immediate rewards (extrinsic), while interactive content such as video-based storytelling and real-life conversations enhance intrinsic motivation by making language learning more engaging and interactive (Li, 2023). The Self-Determination Theory principles states that autonomy-supportive environments heighten intrinsic motivation, and that is proved by informal integration of digital tools (Deci & Ryan, 2017; Lee, 2020). In the Indian context, these digital platforms encourage learners to pursue English for communication, academic purposes, personal growth and entertainment.

3.2 Informal digital tools Develops Self-Regulated Learning

The action of monitoring the progress, setting goals and selecting topic of interest and reflecting on outcomes can be termed as self-regulated learning. The modern digital applications support this process through various features like progress tracking dashboards, daily reminders and performance analytics. For example, gamified digital tools awards, badges or points for consistency, that trains learners to monitor their own progress without constant teacher intervention (Liu et.al. 2023). The recent studies indicate that learners who consistently used self-regulated strategies like digital platforms showed greater persistence, better time management, and autonomy in language tasks (Benson et.al. 2020; Lee & Drajati, 2019).

3.3 Informal digital tools enabling personalized learning experiences

This includes various digital resources such as YouTube channels, language learning applications and social media groups, that provide different materials and opportunities for practice outside formal instruction (Benson, 2017; Lee & Dressman, 2018). These activities enable learner autonomy by supporting learners to choose content, topic of interest, mode of learning, control pacing, and engage in effective language acquisition. This proves the objective of this study as it explains to what extent the informal learners go to attain learner autonomy through personalized learning experiences.

3.3.1 Personalized Language Learning Tools

The different English language learning applications like Duolingo, Hello English, YouTube videos, and Facebook/WhatsApp language groups provide interactive tutorials, exercises, language learning games and activities that enable English language acquisition promoting independent learning (Lee, 2020; Lee & Djati, 2019).

Benefit: These informal learning tools enhance vocabulary acquisition, listening comprehension, pronunciation, and reading fluency. The language learning applications mostly include contextual exercises that introduce learners to different sentence structures, idiomatic expressions, and everyday vocabulary. (Godwin-Jones, 2017).

Practical effect: The learners revisit, replay and pause the content at their own comfortable time, allowing deep understanding and gradual mastery. For instance, watching English vlogs on YouTube related to technology, cooking, travel not only introduces targeted vocabulary but also improves learners' ability to understand spoken English in natural settings. Similarly, participatory elements in language applications, such as adaptive exercises, quizzes and puzzles strengthen learning through immediate feedback and repetition (Chen & Kent, 2020).

Indian context: The English language exposure is limited to teacher-led (teacher centred) instruction and textbooks in most of the schools in India. These digital platforms enable informal learning practices allowing learners to practice real-life English, thereby bridging gaps in listening and speaking skills. For example, rural or semi-urban learners who do not have access to native English speakers can engage in interaction through social media groups or online platforms to develop

communicative competence (Benson, 2017; Lee & Djati, 2019).

3.3.2 Digital interactive platforms

The platforms such as Reddit and Quora, online forums and school-based groups allow learners to discuss topics in English, providing opportunities for interactive collaboration and resource sharing.

Benefit: This interactive participation encourages sentence construction, writing skills and critical thinking, also encouraging relatedness, as learners connect with instructors and peers globally (Wang & Chen, 2024). It helps in clarification and understanding of meaning and feedback exchange, which are important for language development.

Practical effect: The grammar accuracy, vocabulary application, and pragmatic use of language can be attained by different practical means like posting opinions, responding to queries, or engaging in debates, which strengthens the communicative skills. For instance, a learner engaging in an English discussion forum, on environmental issues might practice specialized argumentative writing and vocabulary, thereby gaining both language skills and confidence in using English in meaningful contexts.

Indian context: In India, the learners rarely get opportunities for peer interaction in English as most of the schools has teacher-centred classrooms. The schools can provide basic audio and video based basic tools that provide safe spaces for practice and feedback, especially for learners in low-resource schools, enhancing motivation and active participation. The government can provide e-library facilities with at least a computer and headset that cost around Rs.20, 000. (Wang & Chen, 2024).

To address the core psychological needs of autonomy, competence, and relatedness as outlined in Self-Determination Theory these digital tools provide self-paced and adaptive learning opportunities. This proves the necessity of integrating informal digital tools in English language acquisition that enables learner autonomy that proves the SDT principles in the Indian context. These digital-mediated tools strengthen learner autonomy by shifting control of the learning process from teachers to learners, allowing them to take ownership of their progress. Moreover, the Indian classrooms known for Teacher-centred classrooms becomes learner-centred classroom by integrating the informal digital methods for English language acquisition. The autonomy practices supported by digital tools empower the learners to evaluate and follow their own development, reducing dependency on external instruction. Moreover, these elements signify that integration of informal digital tools not merely supplement traditional instruction but actively cultivate independency the crucial factor for learner autonomy in English language acquisition. This directly validates and proves the study's focus, as it demonstrates how learner autonomy is fostered through informal learning practices within the Indian educational context (Deci & Ryan, 2017; Lai, 2021; Benson & Huang, 2020).

4. Literature Review

The Autonomous learners are naturally motivated, that engage them in activities that are seen as modern methods of English language acquisition says Deci and Ryan, (2017) followed by Benson, (2017). The learners without any intervention, independently take part in experimentation that boosts confidence among the learners to improve their communication skills (Benson, 2017; Lee, 2020). The learners are prone to creativity, engaging in original content creation making them genuine learners and writers (Piaget, 1973; Schunk, 2019). According to Rahimi and Zhang (2012), this autonomy practices develops a number of good characteristics among the learners making them proficient English language learners. The learners develop both the motivation and flexibility to persist and explore English in innovative ways, leading to deeper involvement and sustained proficiency

The role of Learner autonomy is acknowledged as a requirement for significant progress in English language learning, particularly in non-native contexts with limited classroom exposure (Benson, 2017; Lai, 2022). The autonomous learning considers learners as active agents, making independent decisions about learning strategies and

resources unlike the traditional methods (Fan & Wang, 2023). The Empirical study of this research indicates that autonomy corresponds with greater persistence, communicative competence and motivation particularly when learners engage in reflective practices by setting their goals

4.1 Learner Autonomy and Its Necessity

The learner autonomy has been consistently regarded as an essential factor for second language learning, where classroom exposure to English learning is limited (Benson, 2017). The recent studies shows that autonomy is essential and can be attained easily through the integration of digital tools. In the olden days, the learners were forced to follow traditional methods as there are no such digital tools that can enhance their learning. According to Rahim (2022) integration of technology is easier compared to other forms of learning as it gives quicker results and can be attained in a shot span of time compare to other traditional methods. This once again proves the necessity of learner autonomy. Though, the digital integration is easy to access and implement globally, in India access to qualified teachers and resources are limited. However, post-pandemic most of the learners are aware of different applications however, they lack practical knowledge. The learners can overcome this by using tutorials on how to use different applications which is quite common in India (Lai, 2022). This aligns with the objective of evaluating autonomy as a condition for sustainable English acquisition.

4.2 Informal Digital Learning (IDLE) as a Driver of Autonomy

IDLE provides contextual exposure, giving realistic natural experiences—through apps, films, or social media that most of the traditional classrooms lack (Lee, 2020; Zadorozhnyy and Icy Lee, 2025). The recent studies suggests that informal digital learning environment improves listening, speaking, writing, reading, vocabulary, and willingness to communicate (Soyoof and MC Lay, 2023). In India, the learners with stronger self-regulation transform IDLE into real progress, while others remain as passive learners (Lai & Gu, 2021). This observation directly informs that autonomy grows not only from access to tools but also the learner's engagement and responsibility in building their interest for the language (Lee, 2020). Rahimi and Zhang (2021) show that self-reflective practices correlate with higher resilience, while Schunk (2019) argues that evaluation transforms normal activity into meaningful learning. The classroom digital tools and IDLE remain superficial without these. (Chen & Kent, 2020). This critique aligns with the suggestion that reflective scaffolds be embedded into both formal and informal settings.

4.3 Autonomy through Connected Learning

The autonomy is not an independent venture. The different studies demonstrate online exchanges, peer interaction and group projects enhance responsibility and engagement (Lee & Dressman, 2018; Soyoof et al., 2023). This supports SDT's principle of relatedness and emphasises that independency grows through interdependency. Thus, it extends beyond individual effort and autonomy flourishes in socially-interactive and digitally connected environments. The informal Digital platforms bridge the existing gap, enabling learners, particularly in rural or semi-urban areas, to access learning resources, participate in peer interactions, and receive feedback (Bhatia & Rani, 2019; Times of India, 2023). These digital supported strategies, encourage self-regulation enabling autonomy confirming the findings of the study that students who engage in informal digital practices demonstrate significantly higher autonomy (H_1: $F = 66.84$, $p < .001$).

The access to natural language contexts, using virtual mode can connect the learners with native speakers or help them to participation in online communities can enhance proficiency (Benson, 2017; Lee & Dressman, 2018). The schools in India can come together to implement these strategies, where the educators can create realistic, supportive learning environments that helps learners to take control of their language learning journey and develop prolonged autonomy practices in English language acquisition (Wu, 2025; Soyoof, and Fatemeh, 2022).

5. Objectives

1. To explore the extent to which high school learners engage in informal digital practices.
2. To examine the relationship between digital integrated classroom tools and learner autonomy, with subject to self-regulation, and motivation and personalization (e.g., mobile apps, online videos, games, and social media) for English language learning.
3. To compare the learning outcomes of students who actively engage in autonomous and technology-mediated practices with those who rely solely on classroom instruction.
4. To differentiate the relevance of Self-Determination Theory (SDT) and Constructivist Learning Theory in explaining different patterns of learner autonomy.
5. To suggest strategies and recommend alternative methods for integrating learner autonomy into English language teaching in Indian classrooms.

6. Research Hypothesis

6.1 H_1 (Comparative)

H_0: There is no significant difference in learner autonomy between learners who engage in informal learning practices and those who completely rely on traditional classroom instruction.

H_1: The learners who engage in informal digital learning practices demonstrate significantly higher levels of learner autonomy in English compared to the formal traditional learners

6. 2 H_2 (Relational/Impact)

H_0: Digital tools (e.g., mobile apps, online platforms, games) do not significantly influence learner autonomy in terms of personalization, self-regulation, and motivation.

H_2: Digital tools significantly enhance learner autonomy by improving personalization, self-regulation, and motivation in English language learning.

7. Research Methodology

7. 1 Research Design

This study employed a quantitative survey approach using a structured questionnaire to measure learner autonomy in English language acquisition. The design enabled systematic data collection from high school students aged 16 to 18 comparing the informal learners engaged in informal/digital learning and the formal learners who rely on classroom instruction. The Statistical tests such as ANOVA and regression were applied to analyse the differences and their relationships.

7.2 Data Collection

Structured Questionnaire

A structured questionnaire consisting of 20 items was distributed among high school learners aged 16 to 18 for data collection. The questions focused on informal digital learning practices, and the integration of digital tools in English language learning. The Participants responded using a 5-point Likert scale ranging from Strongly Agree to Strongly Disagree. The collected responses provided findings into the extent of autonomous learning, the role of informal and digital integration in English language acquisition. Also, it provided the differences between the informal and formal leaners demonstrating differences in their level of autonomy. This approach provided the systematic analysis of the relationship between learner autonomy and digital/informal learning strategies proving the objectives of the study.

Sample and Participants

The study engaged a total of 80 (n=80) high school students aged 16 to 18 years, selected from eight different schools across the Southern region (India). The participants were chosen to represent different range of academic backgrounds and exposure to English language learning. By analysing the answer patterns (questionnaire responses), between Q1 and Q10 the researcher is able to classify the learner behavioural pattern as (informal and formal) with thirty-three (33) learners preferring formal learning and remaining forty-seven (47) learners preferring

informal digital learning. For the purpose of analysis thirty learners (n=30) from each category is taken. Thus, the sample enabled a comparative analysis between the two set of learners i.e. formal and informal learners. The sample size was considered sufficient to explore the different strategies of learner autonomy as in motivation, self-regulation and experimentation and to evaluate the impact of digital tools enabling language acquisition.

8. Results and Discussion

The questionnaire documented the learners' engagement with informal learning practices as well as their autonomy, motivation, experimentation, and self-regulation. Responses were collected and systematically coded for analysis.

Questionnaire

Items 1–10 measured learners' engagement with informal learning practices, adhering to different autonomy aspects like motivation, self-regulation and experimentation providing findings into how learners independently practice English outside the classroom.

Items 11–20 is focused on digital integration, examining the impact of digital tools on personalization, self-regulation, and motivation.

Hypothesis Testing

H_1 (Comparative): Responses to informal learning items (1–10) were compared between learners (Informal learners) who actively engage in informal/digital learning and learners (formal learners) who depend classroom instruction to determine differences in learner autonomy.

H_2 (Relational/Impact): Responses to digital integration items (11–20) were analysed to evaluate how digital tools influence autonomy, self-regulation, motivation, and personalization in English learning.

Statistical Analysis

The descriptive statistics was used to review the participants' responses. However, the inferential tests such as ANOVA and regression analysis examined the differences between groups (informal and formal learners) and relationships between digital integration and learner autonomy. This approach assured a comprehensive evaluation of how informal digital learning practices contribute to autonomous English learning in the Indian high school context. The hypothesis details in the Table 1.

Table 1: Hypothesis details

No.	Statement	Theme	Linked Hypothesis	Aspects of Learner Autonomy
1	I watch English-language videos, TV shows, or YouTube content to improve my language skills.	Informal Digital Learning	H1	Exposure / Confidence
2	I read online articles, blogs, or e-books in English to enhance my understanding.	Informal Digital Learning	H1	Autonomy / Reading Comprehension
3	I participate in social media groups, forums, or discussion boards in English.	Informal Digital Learning	H1	Collaboration / Engagement
4	I play English-based language games or quizzes to strengthen vocabulary and grammar.	Informal Digital Learning	H1	Motivation / Experimentation
5	I actively use English when communicating with friends, family, or peers outside school.	Informal Digital Learning	H1	Real-life Practice / Autonomy
6	I experiment with new words or expressions learned through informal digital activities.	Informal Digital Learning	H1	Experimentation / Autonomy

7	Informal digital learning helps me feel more confident using English in real-life situations.	Informal Digital Learning	H1	Confidence / Self-Regulation
8	Engaging with English content digitally makes learning more enjoyable than relying solely on classroom instruction.	Informal Digital Learning	H1	Motivation / Autonomy
9	I reflect on what I learn from informal digital activities to improve my English proficiency.	Informal Digital Learning	H2	Self-Regulation / Reflection
10	I seek opportunities to apply English skills learned digitally in real-life contexts.	Informal Digital Learning	H1	Responsibility / Application
11	I use mobile apps (e.g., Duolingo, Hello English) to practice English independently at my own pace.	Digital Tools Supporting Autonomy	H2	Personalization / Autonomy
12	Online tutorials, videos, or podcasts allow me to personalize my learning according to my needs.	Digital Tools Supporting Autonomy	H2	Personalization / Motivation
13	Digital tools help me set personal learning goals and monitor my progress effectively.	Digital Tools Supporting Autonomy	H2	Self-Regulation / Goal-setting
14	I feel motivated to practice English regularly because of interactive features in digital tools.	Digital Tools Supporting Autonomy	H2	Motivation / Engagement
15	I feel confident experimenting with new English expressions while using digital platforms.	Digital Tools Supporting Autonomy	H2	Experimentation / Confidence
16	Using digital tools allows me to collaborate with peers and receive constructive feedback.	Digital Tools Supporting Autonomy	H2	Collaboration / Constructivism
17	Feedback from apps or online platforms (e.g., scores, AI suggestions) helps me improve my language skills.	Digital Tools Supporting Autonomy	H2	Competence / Self-Regulation
18	Digital tools enable me to manage my learning independently without relying solely on teachers.	Digital Tools Supporting Autonomy	H2	Autonomy / Responsibility
19	I use digital tools to revisit challenging content and reinforce understanding at my own pace.	Digital Tools Supporting Autonomy	H2	Self-Regulation / Personalization
20	Using digital tools encourages me to take responsibility for my learning and track my progress.	Digital Tools Supporting Autonomy	H2	Autonomy / Self-Monitoring

The ANOVA test effectively compared the groups and proved the study's main objective as how informal digital learning promotes learner autonomy. The results provided strong evidence supporting the proposed hypotheses, demonstrating significant differences between the groups and confirming the positive role of digital tools and informal strategies in fostering learner autonomy. Table 2 shows ANOVA of informal learning and learner autonomy.

Table 2: ANOVA for H_1 – Informal Learning and Learner Autonomy

Group	N	Mean Autonomy Score (Items 1–10)	Standard Deviation
Group A (Informal Digital Learning) i.e. Informal Learners	30	4.20	0.50
Group B (Traditional Classroom Only) i.e. Formal Learners	30	3.20	0.50

The ANOVA results revealed a statistically notable difference in learner autonomy between the two groups. The analysis produced an F-value of 66.84 with a p-value of 3.11×10^{-11}, which is well below the 0.05 threshold. This indicates that the null hypothesis was rejected, confirming that learners who engaged in informal and digital learning practices demonstrated significantly higher levels of learner autonomy compared to the formal learner's dependent on classroom instruction. The Figure 1 represents the data in the form of scatter plot.

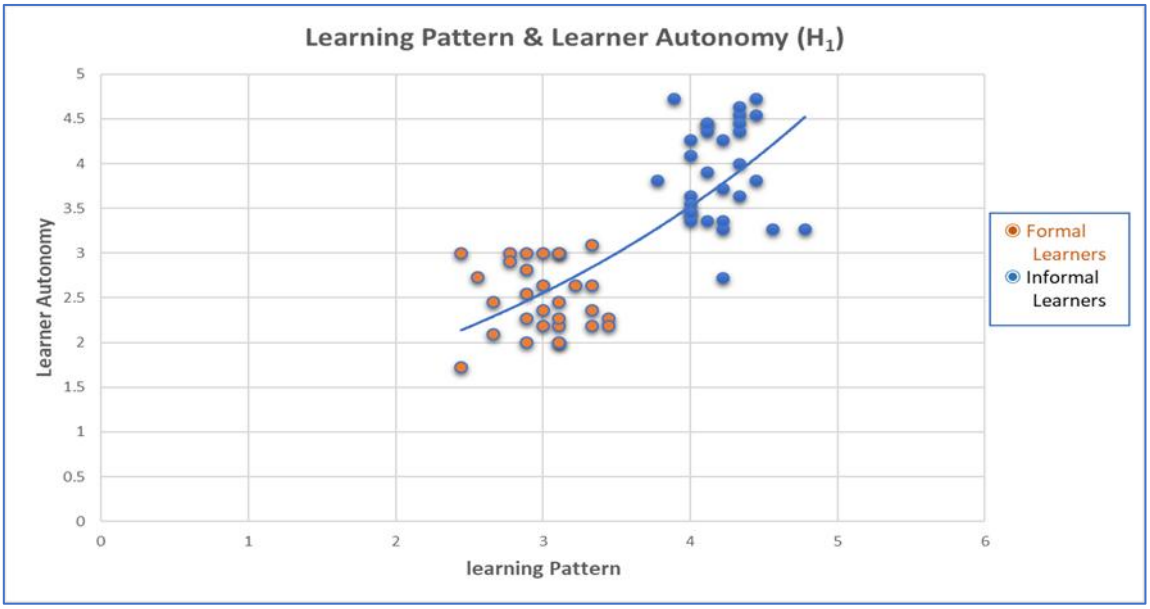

Figure 1 : Scatter Plot of Informal Learning and Learner Autonomy

Table 3: ANOVA for H_2 – Digital Integration and Learner Autonomy

Group	N	Mean Autonomy Score (Items 11–20)	Standard Deviation
Group A (Using Digital Tools)	30	4.00	0.50
Group B (Traditional Classroom Only)	30	3.10	0.50

The Table 3 shows ANOVA of digital integration and learner autonomy. The ANOVA test showed an F-value of 55.70 with a p-value of 4.88×10^{-10}. Since the p-value is well below 0.05, the null hypothesis was rejected. This confirms that informal digital integration significantly influences learner autonomy in English learning. The Figure 2 shows the scatter plot of digital integration and learner autonomy.

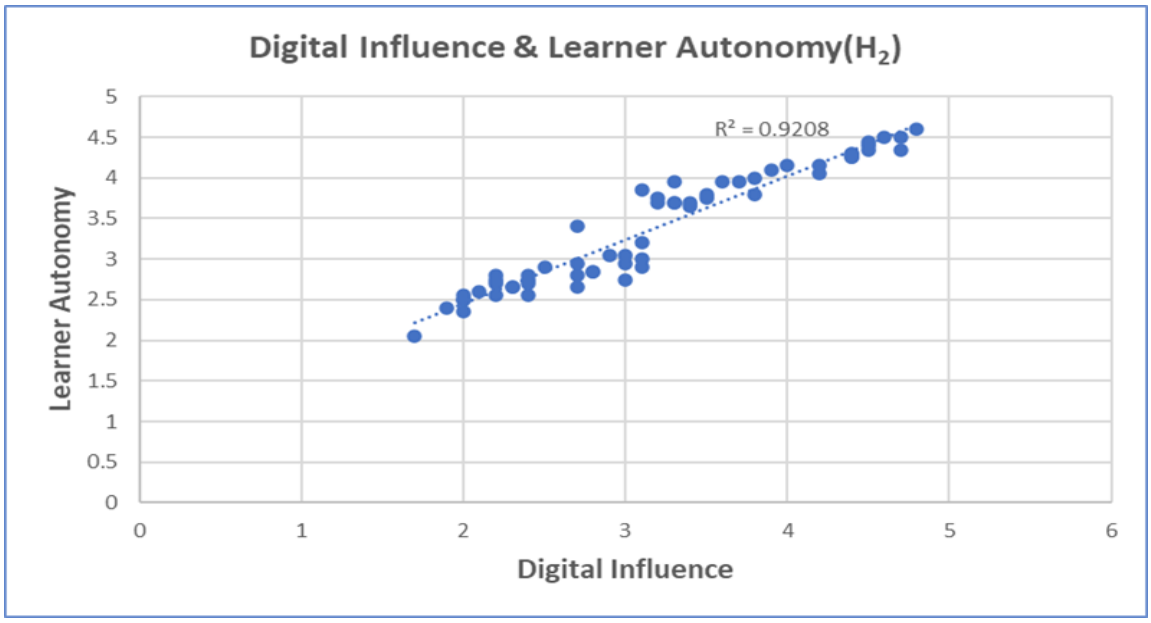

Figure 2: Scatter Plot of Digital Integration and Learner Autonomy

9. Findings

9.1 Performance of Technology-Integrated Learners

The learners who engaged in informal digital learning practices demonstrated clear strengths in their approach to English language acquisition. They showed stronger performance in specific language areas. For instance, the learners who frequently watched English films or videos were exceptionally talented at comprehending spoken English and recognizing everyday expressions. The learners who read digital texts such as stories or blogs displayed better vocabulary use and reading fluency. In addition, participants who interacted through social media and online language learning games in showed greater confidence in short written communication. These instances emphasize how informal practices contributed to skill development beyond formal instruction. The Motivational aspect can be observed throughout their performance and it was heightened through real-life digital contexts, which sustained both extrinsic and intrinsic engagement. Moreover, personalization of learning content enabled these learners to customize pace, revisit challenging areas, and pursue topics of personal interest, resulting in higher confidence and greater communicative competence.

9.2 Performance of Traditional Learners

The formal Learners who relied solely on classroom instruction displayed significant weaker autonomy. The findings reveal an increase dependence on teachers for instruction. The learners were unable to do self-reading. The introduction was given beforehand as what the questionnaire is about and what it meant explaining each and every item from 1 to 20. Despite receiving beforehand instructions from the researcher on completing the questionnaire, the leaners waited for the teacher's guidance showing higher dependency on teacher support. The learners needed teacher's guidance before attempting each and every task and rarely explored learning on their own. For example, when given an uncommon text, they expected step-by-step explanations instead of trying to derive meaning through context.

Similarly, in writing activities, they depended heavily on exemplary answers rather than experimenting with their own ideas. They tried to discuss the answers with their friends and share the same response written by their friends. This over-dependence on systematic guidance limited their ability to take initiative and hindered the development of independent problem-solving skills in English. Their motivation was exam-oriented, with little intrinsic drive to use English beyond

prescribed curriculum. The lack of exposure to different English learning contexts prevented their opportunities to apply knowledge practically, leading to slower understanding of concepts, vocabulary growth, weaker fluency, and reduced confidence.

9.3 Comparative Gap Between the Groups

The comparative analysis revealed an extensive gap between the two groups. The digital integrated informal learners outperformed the dependent formal learners across different dimensions of autonomy, motivation, and creativity. This difference can be associated with access to digital tools, self-paced learning opportunities, and informal exposure to English through digital media. The formal learners were constrained by systematic, teacher-centred learning, limited classroom hours, and a lack of resources for independent practice like task-based and interactive learning practices which directly affected their autonomy. development.

9.4 Validation of Hypothesis

The ANOVA test provided statistical confirmation of these patterns. For H_1, learners who engaged in informal digital learning scored significantly higher in autonomy compared to those relying on classroom instruction alone ($F = 66.84$, $p < .001$). For H_2, digital integration was shown to have a strong impact on learner autonomy through motivation, self-regulation, and personalization ($F = 55.70$, $p < .001$). In both the cases, the null hypotheses were rejected, validating the study's objective that informal digital integration enhance learner autonomy in English language learning.

Based on the findings of this study, it is clear that informal digital integration plays a crucial role in promoting learner autonomy in English language learning. However, the results also explain the existing gaps, particularly among the formal learners who rely solely on traditional classroom instruction. Therefore, the following suggestions and recommendations are presented to strengthen autonomy-supportive practices. These are coordinated with the study's objectives, validated hypotheses, and insights drawn from the literature review, while also considering the challenges, limitations and opportunities within the Indian educational context.

Integrating digital tools into Classroom Pedagogy: The findings indicate that digital tools promote learner autonomy by enabling personalization, self-regulation, and motivation. Therefore, as mentioned earlier in the strategies enabling autonomy the Indian schools must systematically implement basic mobile applications, adaptive platforms, and AI-based feedback systems into the curriculum (Benson, 2017). The schools can support the learners by proving PCs, Projectors in the classroom that can effectively help the learners. The teachers can replace the traditional instruction with apps like Duolingo or Hello English to provide daily practice opportunities. They can start the informal environment just by making the classroom more interactive and learner-centred. The initial stages might be hard but they can start from the basics. This basic integration aligns with Lai's (2021) emphasis on making the classroom more learner-centric using basic informal learning methods. This supports the objectives of the study suggesting changes in Indian classroom that enable learner autonomy.

Encouraging Informal Learning Beyond the Classroom: The autonomy as mentioned earlier, thrives in informal contexts, and therefore the learners should be encouraged to engage in such learning outside the classroom. (Lai, 2021; Benson et.al. 2020), These practices allow learners to experiment creatively and connect language learning with personal interests. According to Benson et.al. (2020) the informal learning environments empower learners to take responsibility of their progress, while Lee (2020) shows that digital exposure strengthens communicative competence. The informal learning strategies like watching YouTube, participating in online platform enables learners to improve their communication skills. The current study's findings confirm that these informal practices are beneficial in Indian classrooms that are mostly exam-oriented. (Rao & Kumar, 2021).

Teacher Training for Autonomy-Supportive Practices: The teachers in Indian classrooms often remain exam-

oriented, limiting opportunities for autonomy development. Therefore, different professional development programs can be conducted to training teachers in creating autonomy-supportive environments through flexible task design, use of blended learning strategies, and encouragement of learner choice. This aligns with Self-Determination Theory (Deci & Ryan, 2017), which states the importance of autonomy-supportive teaching for sustaining motivation, and aligns with Schunk's (2019) constructivist theory, that learners construct knowledge when given authentic opportunities for engagement.

Alternative Methods for the Indian Context: The alternative approaches or similar autonomy enabling tools can further promote learner autonomy in English language acquisition. This includes peer-learning circles, project-based learning, task-based learning and English clubs provide low-cost, community-based alternatives encourage experimentation, communication, and collaboration. Suresh and Ramesh (2020) emphasize that localized informal learning methods stay highly effective in rural and resource-limited contexts. According to Lee and Dressman (2018) collaborative, peer-based tasks enhance both learner independence and communicative competence. These alternative approaches assure that autonomy-supportive models are adaptable across different educational settings (Rahimi and Zhang, 2021).

Administrative Level Recommendations: The curriculum boards should encourage blended learning methods that integrate digital tools with traditional instruction, i.e. blending formal and informal learning, shifting the focus from teacher-centred, instruction-based learning to skill-based learning (Lee, 2020). The syllabus including informal learning tasks into homework, assignments, projects and assessments based on performance can be initialized in the future academics. This ensures long-term sustainability among the learners rather than seeing English as a subject and memorizing the concepts for exam purposes and forgetting later. This aligns with Godwin-Jones (2018) statement that educational policy must shift to digital language learning, while Fan and Wang (2023) found that the perceptions of blending digital tools into the curriculum lies in the hands of authorities who can help in the betterment of their future.

10. Limitations of the Study

Each research study is bound by certain limitations, and acknowledging them provides transparency framing the scope for further study. The present study was carefully created to explore learner autonomy in the Indian context through informal digital mediated learning; however, a few boundaries are mentioned below:

Context-Specific Sample: The study focused on high school learners aged 16 to 18 from selected schools in India. This localized sample may not represent all educational contexts; it offered detail perspective into learner autonomy within a practical and culturally aligned setting. Therefore, the further studies can change the sample from primary to middle or even higher also considering the age factors. The settings (Urban or rural) can be changed based on the researcher's study.

Scope of Tools Used: The study examined specific digital informal strategies (such as language apps, podcasts, and online forums). Other advanced technologies like virtual reality (VR), augmented reality (AR), or AI-driven chatbots were not included, as the study prioritized tools accessible and relevant to Indian learners. The researchers can further focus on these advanced technologies for their research study.

Time Constraints of Intervention: The digital integration strategies were studied over a limited academic timeframe. Although a longer duration could reveal further long-term impacts on learner autonomy, the timeframe used in this study was sufficient to identify the learner's performance and comparative differences between groups.

Infrastructure Limitations: The differences in access to digital devices and internet connectivity, are not same particularly in rural areas, that explains natural constraints. However, this does not weaken the study, instead this reflects real challenges in the Indian educational system and highlights the importance of implementing autonomy-supportive

practices adaptable to different learning environments.

11. Conclusion

This study explored how far learner autonomy can be enhanced through informal digital learning in Indian educational context. The findings clearly explain the existing gap showing the differences with regard to higher and weaker autonomy among the informal and formal learners respectively. The results validated both hypotheses confirm that digital informal practices not only supplement but also transform language learning by fostering independence, creativity, and sustained engagement. The analysis clearly indicates the necessary actions that can be implemented to support the learners for better learning practices. The theoretical insights such as Self-Determination Theory and empirical studies on learner autonomy highlights the need for Indian schools to transform beyond exam-oriented environment to autonomy-supportive models. Though certain limitations related to sample size, tool scope, timeframe, and infrastructure exist, these boundaries do not weaken the contribution of the research instead, they explain the contextual realities in which Indian learners exist. Finally, this research contributes to the knowledge gain and independency attained through learner autonomy. The English language acquisition attained at the end of the process demonstrated that informal digital strategies can empower learner's progress. The insights and recommendations given offer practical pathways for teachers, policymakers, and curriculum designers to reform the English learning context in India, ensuring that learners are globally competent. The suggestion and recommendations proposed can change the learners view of English language improving their confidence.

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