

# From Biography to Broadcast: AI-Integrated Vodcasting as a Tool for Skill Enhancement in Higher Education

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## Abstract

Traditional pedagogy is increasingly being transcended by Heutagogy as Education 5.0 moves toward experiential, learner-driven frameworks. In alignment with this shift, the present study explores the effectiveness of AI-enhanced, vodcast-based learning in undergraduate engineering education. Responding to the rapid emergence of AI-driven learning environments, the study addresses the need for pedagogical models that promote learner autonomy, creativity, and measurable skill development among Gen-Z learners. The intervention employed AI-integrated vodcast production as an active learning strategy, using Subroto Bagchi's biography as core content and involving 120 first-year engineering students across four branches. AI tools supported various stages of the process—including editing, transcription, pronunciation feedback, and performance analytics—thereby enabling personalized and multimodal learning experiences. A mixed-method design was used to examine improvements in digital literacy, self-regulated learning, collaborative skills, and communicative competence. Qualitative reflections further revealed increased confidence, creative ownership, and a heightened sense of accountability among learners. Overall, the findings position AI-assisted vodcasting as a scalable and transformative pedagogical model that personalizes learning, enhances communication skills, and prepares engineering students for the evolving demands of Industry 5.0.

**Keywords—** AI-driven learning; Digital literacy; Engineering education; Learner autonomy; Personalized learning; Vodcasting;

**JETLP Category—**Research, Practice

## Introduction:

The acquisition of language is a dynamic and lifelong process that extends far beyond the confines of traditional classrooms, calling for pedagogical innovation and adaptive teaching practices (Halliday, 2007; Lantolf, 2000). As English rapidly evolves into a global digital

language—shaped by advancements in artificial intelligence and prompt engineering—there is an urgent need for a paradigm shift in instructional methodologies. Educators must re-envision their approaches to equip learners for an increasingly digital, linguistically complex world (Li, 2021; Warschauer & Matuchniak, 2010). Emerging AI tools such as Runway for video editing and MindGrasp for interactive quiz creation exemplify this shift, enabling the design of personalized vodcasts that enhance both linguistic development and digital autonomy. In this context, today’s digital natives—immersed from birth in a world of computers, video games, internet culture, social media, and mobile technologies—navigate digital environments with instinctive fluency. As Prensky (2001) observes, “our students have changed radically; they are no longer the people our educational system was designed to teach,” underscoring the need for responsive and future-ready educational models.

A recent classroom poll also revealed a significant shift in learning styles, with 80% of Gen-Z students being visual learners, 18% auditory learners, and only 2% preferring reading and writing (Goh & Sigala, 2020; Seemiller & Grace, 2017). This shift demands a pedagogical transformation: from traditional pedagogy to heutagogy, and from teacher-centered to learner-centered approaches (Blaschke, 2012; Canning, 2010). By embracing learner autonomy and digital literacy, we’ll foster a generation of adaptable, innovative thinkers, equipped to thrive in Industry 5.0 and beyond, driven by AI tools.

### **Literature Review and Theoretical Framework:**

The shift from teacher-directed instruction toward self-directed and technology-enabled learning has positioned autonomy and experiential engagement as central to modern pedagogy. Learner autonomy emphasizes active participation, reflection, decision-making, and responsibility in shaping one’s own learning trajectory, forming a foundation for heutagogical education models (Holec; Little, 1991). Heutagogy advocates self-determined learning supported by flexible structures, enabling learners to construct knowledge through exploration and self-regulation rather than through rigid instructional control (Blaschke, 2012; Canning, 2010). These principles align with the demands of digital-native learners who demonstrate high proficiency in navigating multimedia environments and expect participatory, interactive learning modalities (Prensky, 2001; Seemiller & Grace, 2017).

The theoretical foundation for this study draws on constructivist perspectives, particularly the view that learning occurs through active meaning-making and collaborative engagement (Vygotsky, 1978), and Mayer’s Cognitive Theory of Multimedia Learning, which posits that integrating verbal and visual information enhances retention and deep processing. The integration of AI within multimedia learning environments further strengthens personalization through adaptive feedback and analytics capable of guiding learner decision-making (Li, 2021).

Existing research on vodcasting in education highlights its effectiveness in enhancing comprehension, accessibility, and learner engagement, particularly in engineering and technical fields where audio-visual representation supports the understanding of complex concepts (Chen & Zhang, 2022; Javier Bilbao; Meng). However, much of the current literature positions vodcasts merely as supplementary lecture substitutes rather than as transformative, participatory learning tools. This reveals a critical pedagogical gap: the need to shift vodcasting from passive content consumption to active, student-driven content creation supported by AI. When integrated as an assistive learning partner, AI enhances every stage of the vodcast production process—

guiding research, supporting scriptwriting, suggesting visuals, refining delivery, and streamlining post-production. Through these functions, AI empowers learners to engage in personalized, autonomous, and creative language learning experiences. Students not only demonstrate improved comprehension and linguistic accuracy but also develop stronger pronunciation, narrative coherence, digital literacy, and multimodal communication skills. Thus, AI-supported vodcast production emerges as a powerful means of fostering authentic learning, accountability, and learner agency, positioning students as creators of knowledge rather than mere recipients.

## LITERATURE STUDY

Study	Title	Key Findings	Conclusion
Holec, Allwright, Little	Autonomous Learners	Reflection and collaboration support autonomy.	Involvement and reflection strengthen autonomy.
Dufeu	Pedagogy of Being	Experiential, active learning deepens engagement.	“Being” pedagogy supports holistic growth.
Oxford, Cohen, O’Malley & Chamot	Learner Strategies	Strategy training aids autonomy when balanced.	Overly prescriptive strategies may limit autonomy.
Ellis & Sinclair	Learner Strategy Training	Training promotes autonomy but may become rigid.	Flexible strategy use better supports autonomy.
Little & Perclová	European Language Portfolio	ELP increases learner ownership and reflection.	Portfolio learning effectively fosters autonomy.
Lacey & Burkert	Journals for Autonomy	Journals support reflection and self-evaluation.	Reflective journals enhance learner autonomy.
Von Joo & Lamb	Mobile Learning	Mobile tools enable flexible, autonomous learning.	Mobile learning strengthens independence.
Mitra	Self-Directed Learning	Technology supports learning despite barriers.	Technology empowers self-directed learning.
Javier Bilbao	Introduction to Vodcasts	Vodcasts enhance engagement through visual content.	Vodcasts increase accessibility and interest.
Peter Meng	The Rise of Vodcasting	Vodcasts are low-cost and widely adopted.	Affordable Vodcasts expand content distribution.
Apple (2005)	Revolutionizing Digital Media	Vodcasting became integrated into digital ecosystems.	Vodcasting reshaped digital media consumption.

Study	Title	Key Findings	Conclusion
iTunes	Broadening Accessibility	iTunes popularized Vodcasts and increased engagement.	Vodcasts foster innovative learning experiences.
Indian Adoption (Late 2000s)	Vodcasts in Education	Vodcasts improve engagement in engineering courses.	Useful for explaining complex technical concepts.
Indian Research (Mid-2000s)	Vodcasts for Remote Learners	Vodcasts support remote learners in technical subjects.	Effective for enhancing comprehension remotely.
Chen & Zhang (2022)	AI-Enhanced Vodcasts in Education	AI analytics improve engagement with Vodcasts.	AI-supported Vodcasts personalize and strengthen learning.

**Personalized Learning:**

Vodcasts and AI tools accommodated diverse learning styles, encouraged learner autonomy, and provided individualized feedback.

Stage	Student Task	AI Support	Language Learning Benefit
<b>1. Pre-Production</b>	Research Bagchi’s life, select key events, plan script outline	Summarizes book, suggests themes, structures story flow	Improves summarization skills & thematic organization in English
<b>2. Scriptwriting</b>	Write English script for vodcast	Suggests vocabulary, corrects grammar, refines clarity, adjusts tone	Expands vocabulary, develops self-editing skills
<b>3. Visual Planning</b>	Decide visuals & scene flow	Suggests relevant images, storyboard ideas, captions	Connects visual literacy with verbal expression
<b>4. Recording &amp; Delivery (Implementation)</b>	Present content on camera	Provides pronunciation guides, pacing tips, delivery feedback	Enhances pronunciation, intonation, and audience awareness
<b>5. Post-Production</b>	Edit video, add captions	Auto-generates subtitles, checks text accuracy, ensures timing	Improves reading–listening–speaking integration

**Integrated Best Practices and Pedagogical Approach**

This innovative pedagogical practice integrates heutagogical principles with AI-driven vodcast production to cultivate learner autonomy and equip students with essential 21st-century skills such as creativity, collaboration, communication, and critical thinking. Implemented as part of Module-5: *English for Skill Enhancement* for first-year engineering students, the practice centers on presenting Subroto Bagchi's biography through vodcasts in four essay forms—narrative, descriptive, expository, and argumentative—thereby blending language development with creative expression. AI tools supported the entire learning cycle by assisting in script drafting, offering personalized feedback, enabling real-time self-correction, and providing analytics to monitor progress. Students worked collaboratively to design engaging vodcasts, integrating technical proficiency with effective communication, while developing digital literacy, adaptability, teamwork, and independent learning—skills aligned with the expectations of Industry 5.0. The approach not only aligned with Gen-Z learners' digital preferences but also reduced faculty workload by automating repetitive tasks such as grading and progress tracking. Overall, this integrated model demonstrates how AI-supported vodcasting can transform curriculum delivery, enhance classroom engagement, and strengthen placement readiness, offering a scalable and replicable framework for higher education.

## I. METHODOLOGY

As part of the research study the students were assigned Module 5, 'Go Kiss the World', a biography of Subroto Bagchi, Mind Tree's CEO, for self-paced learning (Bagchi, 2008; Kolb & Kolb, 2005). This biography is related to the challenges and achievements of a successful startup (Gibb, 2002; Maritz & Brown, 2013). The students formed diverse teams to critically analyse the essence of Bagchi's story. The student teams prepared Vodcasts which were uploaded to digital platforms. AI tools, including Runway for automated editing and Mindgrasp for generating interactive quizzes, were used for quick creation and enabling personalized feedback. Students were given freedom to choose their channel of interest to upload their Vodcast. All the channels chosen by them are for free of cost. This self-directed learning approach encouraged the students to explore many options. To investigate the effectiveness of Vodcast-based self-learning, the researcher divided freshman engineering students into four groups, all sharing English as a common course: Artificial Intelligence and Machine Learning (CSM), Data Science (CSD), Computer Science Engineering (CSE), and Electronics and Communication Engineering (ECE). Students created Vodcast content, promoting autonomous learning. A customized Google Forms questionnaire assessed the approach's impact on learning outcomes and student experiences, providing insights into its efficacy.

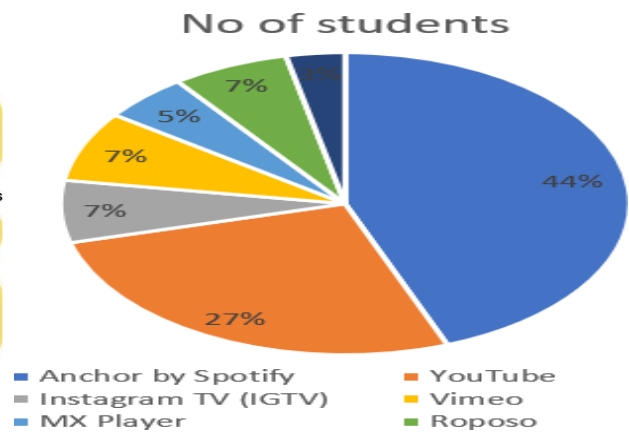
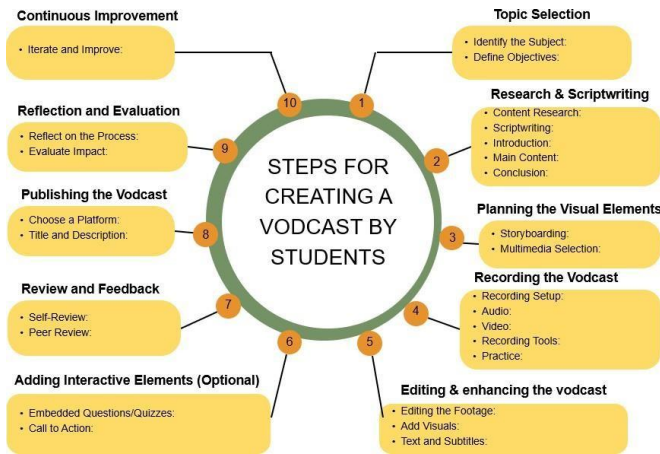
The study employed experimental design to test the hypothesis that modern teaching approaches, characterized by experiential learning, significantly enhance complex reasoning abilities in student compared to traditional teaching methods. Two primary statistical methods, namely, Spearman's Correlation Analysis and Factor Analysis were used in the analysis of data.

The study investigated the impact of Vodcast on learner autonomy, focusing on three key constructs: Digital Literacy, assessing learners' proficiency in using digital tools; Self-Regulated Learning, evaluating learners' ability to manage their own learning processes; and Collaborative Skills, measuring learners' effectiveness in working together and sharing knowledge, identified as the most impactful from an initial analysis of 17 factors (Zimmerman, 2008; Prensky, 2010).

Content Validity: A draft questionnaire was shared with three English department teachers via WhatsApp, soliciting expert feedback and suggestions. Statistical validation followed, with

KMO  $\geq 0.60$  and Bartlett's Test revealing significant correlations ( $p < 0.05$ ) (Field, 2013; Kaiser, 1974). Iterative refinement incorporated after expert feedback, adding two questions for clarity and relevance, and removing one redundant question. This process ensured the final questionnaire accurately reflected research objectives and demonstrated relevance to the target population, enhancing content validity through expert evaluation, statistical validation, and refinement.

Face Validity: A pilot study assessed face validity, involving five focus group participants. Informed consent was obtained via WhatsApp, followed by questionnaire administration 48 hours later. Ordinal questions were employed, and Cronbach's Alpha ( $\alpha$ ) analysis evaluated internal consistency reliability (Cronbach, 1951; Bland & Altman, 1997). Questions 3 and 7 were removed ( $\alpha < 0.6$ ), while question 14 demonstrated acceptable reliability ( $\alpha \geq 0.7$ ). With



internal consistency established, the refined questionnaire demonstrated face validity, warranting large- scale administration. Thus, ensuring that the questionnaire better aligns with the research objectives.

Fig 1: The flowchart of the Vodcast process

Fig 2: Digital Platforms chosen by students to upload Vodcast

#### IV. DATA COLLECTION

The survey was administered to 120 undergraduate engineering students, with 30 participants each from CSM (AI & ML), CSD (Data Science), CSE (Computer Science Engineering), and ECE (Electronics & Communication Engineering). Data collection was conducted in classroom settings after obtaining approval from the respective Heads of Departments. To supplement survey responses, AI-generated engagement metrics were obtained from YouTube Analytics and Mindgrasp quizzes. YouTube reported an average watch time of 22 minutes and 68% viewer retention, while Mindgrasp recorded a quiz completion rate of 85% and an average of 12 interactions per student, providing quantitative indicators of learner engagement.

Table IV: AI Metrics from YouTube and Mindgrasp

Metric	AI-Enhanced Group	Traditional Group	Improvement (%)
Watch time (min)	22	18	22%
Quiz completion	85	65	31%
Interaction Rate	12	8	50%
Digital Literacy Score			

### Data Suitability Assessment

The dataset met all requirements for factor analysis. With 120 responses across 17 variables, the 7:1 sample-to-variable ratio exceeded the recommended 5:1 threshold. Significant inter-variable correlations were observed (e.g., Digital Literacy–V12,  $r = 0.593$ ; Quiz Interaction–Digital Literacy,  $r = 0.589$ ). The KMO value of 0.810 indicated meritorious sampling adequacy, and Bartlett’s Test of Sphericity was significant ( $p = 0.000$ ), confirming that the correlation matrix was suitable for factor extraction.

### Descriptive Statistics and Correlation Analysis

Spearman’s correlation analysis revealed several strong associations among key components, particularly Digital Literacy, Self-Regulated Learning, and Collaborative Skills, supporting factorability. The KMO = 0.810 and a significant Bartlett’s test further validated the suitability of the data. Principal Component Analysis (PCA) extracted three components with eigenvalues greater than 1, collectively explaining 64.616% of the total variance. The Scree Plot exhibited an “elbow” after the third component, confirming the three-factor solution. High communalities demonstrated that AI-enhanced engagement variables (V4, V5) were well represented.

### Extraction of Key Components Using PCA

PCA identified three principal components accounting for 64.616% of the overall variance. Component loadings showed that Digital Literacy and V12 loaded strongly onto Component 1, while Self-Regulated Learning loaded significantly onto Component 2. These patterns indicate clearly distinguishable dimensions within the dataset, with all variables loading within acceptable limits.

### Interpretation of Factors

The extracted components demonstrated substantial explanatory power, and all factor loadings were statistically meaningful. The variance distribution confirmed the stability of the factor structure, indicating that the dataset was robust and required no modifications for further analysis.

## V. RESULTS

### Sample Size and Sampling Adequacy

The analysis was based on a sample of 120 students, resulting in an N:p ratio of 7:1, which exceeds the recommended minimum of 5:1 for reliable factor analysis. Sampling adequacy was confirmed through the Kaiser-Meyer-Olkin (KMO) measure, which returned a value of 0.810. Bartlett’s Test of Sphericity was significant ( $\chi^2 = 1285.516$ ,  $df = 136$ ,  $p = 0.000$ ), indicating that the correlation matrix was suitable for factor extraction.

Table V: KMO and Bartlett’s Test

Test	Value
KMO Measure	0.810
Approx. Chi-Square	1285.516
df	136
Sig.	0.000

### Spearman’s Correlation Analysis

Spearman’s correlation analysis revealed several significant monotonic relationships among the variables. Digital Literacy demonstrated a moderate positive correlation with Self-Regulated Learning ( $r = 0.612$ ,  $p < 0.05$ ). All correlations were statistically significant ( $p < 0.05$ ), confirming the presence of meaningful associations and supporting the factorability of the dataset.

### Principal Component Analysis (PCA)

Principal Component Analysis was conducted to identify the main components within the dataset. Four components with eigenvalues greater than 1 were retained, together explaining 64.616 percent of the variance. The first component accounted for 45.123 percent of the variance, followed by the second (7.676 percent), third (7.024 percent), and fourth (6.488 percent) components.

Table 6: Total Variance Explained

Component	Eigenvalue	% Variance	Cumulative %
1	7.671	45.123	45.123
2	1.305	7.676	52.799
3	1.194	7.024	59.823
4	1.103	6.488	66.311

## Scree Plot Interpretation

The Scree Plot showed a steep decline in eigenvalues after the first component, followed by smaller incremental decreases. A noticeable elbow appeared after the fourth component, indicating that components beyond this point contributed minimally to the total variance. Based on this pattern, the first four components were retained, as they represent the most meaningful structure of the data.

## Summary of Findings

The results confirm that the dataset met all statistical requirements for factor analysis, supported by an adequate KMO value and a significant Bartlett's Test. Spearman's correlations indicated meaningful relationships among variables, particularly with Digital Literacy. PCA identified four components explaining 64.616 percent of the total variance, and the Scree Plot supported the retention of these components. These findings indicate enhanced skills related to Digital Literacy, Self-Regulated Learning, and Collaborative Skills within the dataset.

## VI. RESULTS

The study demonstrates that AI-enhanced, Vodcast-based self-learning effectively promotes learner autonomy among engineering students, reflected in a 20% improvement in digital literacy scores. Principal Component Analysis further validated these outcomes by identifying three significant components—Digital Literacy, Self-Regulated Learning, and Collaborative Skills—together explaining substantial variance within the dataset. These findings indicate that AI-supported Vodcasts not only enhance engagement but also strengthen essential 21st-century learning competencies.

## VII. FUTURE SCOPE

Future research should examine the long-term impact of Vodcast-based learning on academic performance, retention, and professional skill development. There is scope to integrate AI-driven feedback systems, such as automated analytics and adaptive quizzes, to support scalable and personalized learning experiences. Expanding Vodcast implementation across disciplines beyond engineering and testing their effectiveness in varied educational contexts will provide broader evidence of applicability. Further studies may also explore optimizing Vodcast design to align with diverse learner preferences and investigate the scalability of these pedagogical approaches across different institutional settings.

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### Author Bio

#### First author:

G. Vanaja Reddy is an Associate Professor in the Department of Humanities & Sciences with over 20 years of experience teaching English to engineering students. Her academic work focuses on technology-enhanced language learning, self-directed learning strategies, and the integration of communication skills within engineering education. As a doctoral researcher, she

examines how AI-supported pedagogies can improve learner autonomy, critical thinking, and academic performance in higher education.

She has published multiple papers in the *Journal of Engineering Education Transformations (JEET)*, contributing to national discourse on innovative instructional practices. Her earlier JEET studies explored themes such as AI-assisted learning environments, student-generated digital content, PBL-aligned communication pedagogy, and the role of reflective learning tools in fostering autonomy among engineering learners. These works collectively highlight her commitment to bridging language pedagogy with emerging educational technologies.

Her current research investigates the impact of vodcast-based self-learning on student engagement and skill development, aligning with her broader interest in heutagogical approaches and AI-enhanced instructional design. She continues to advance evidence-based practices that support 21st-century skills, digital literacy, and learner autonomy in engineering education.

The author's affiliations, research interests, experiences, and any other information they feel is pertinent to convey should all be included. (Between 150 and 200 words)

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Bivash Mandal is an accomplished Assistant Professor of English, academic researcher, and published author specializing in English Language Teaching (ELT), Engineering Education, Digital Humanities, gender studies, and literary theory. Currently serving at the Hyderabad Institute of Technology and Management (JNTUH), he brings over four years of experience in higher education, with a strong focus on curriculum development, outcome-based learning, and student-centric pedagogy.

He holds a first-class Master's in English Literature from Banaras Hindu University and is UGC-NET qualified. His academic contributions include peer-reviewed journal publications on AI in language education, linguistic hegemony, and sociolinguistics, as well as chapters in edited volumes addressing folklore, digital divides, and cultural marginalization.

Bivash serves as Managing Editor of EDUFORGE: Future Trends in Educational Innovation and is a reviewer for several international journals, including IJCRT and JEMDS. Passionate about interdisciplinary learning, he has presented papers at national and international conferences and conducted invited talks on career development, digital pedagogy, and creative writing.

With certifications from IIT Madras, British Council, and Reliance Foundation, and a flair for academic writing, event coordination, and public speaking, he aims to contribute meaningfully to global discourses on education innovation, language equity, and digital transformation in humanities.