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RESEARCH PAPER

The Impact of the Connectivist Learning Model on the Writing Skills of Pakistani Digital Natives

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ABSTRACT

The current research aims to investigate the impact of the Connectivist Learning Model on the writing skills of ESL learners in Pakistan. Framework based on Connectivism learning theory strives to enable "social connection" and "mental node development" when writing while offering group idea pooling, debate, transliteration, and editing options. Moreover, it examines how authors create their writings while interacting with their peers. Therefore, to obtain the desired data, a Quasi-experimental approach was used to measure the impact of the model. Ninety undergraduate ESL learners were selected and divided into two groups of 45 each. The groups were randomly selected as control and experimental groups, respectively. Both groups were pre-tested. Only the experimental group received the intervention, while the control group was taught writing skills using the traditional method. After three months, the post-test was administered to both groups, and the scores were compared to see the impact. The results of the tests showed that the experimental group's learners exhibited significant improvement in their writing skills. The implications of this research extend across various dimensions of education, ranging from policy and curriculum design to teacher training and technology infrastructure. By taking these implications into account, educators, policymakers, and researchers can contribute to advancing educational practices that are responsive to the needs of students in an increasingly interconnected and digital world.

KEYWORDS Connectivist Learning Model, Connectivism, Social Connection, Mental Node Development, Pakistani ESL Classes, Writing Skills

Introduction

Today, technology has become an integral part of education at all levels. It has changed the entire education system and brought it to a new level (Napal et al., 2020). Technology has altered the mode students absorb and acquire information. In the past, pupils had to rely on rote learning and memorization to remember information. However, with technological advancement, students can easily access information online and through educational apps, making learning more engaging and effective. In addition, technology has also made it possible for students to receive feedback more quickly and easily. Teachers can now use online platforms to set assignments and track students' progress. This enables educators to identify specific areas where learners want guidance and subsequently adapt their instructional approaches accordingly. Technology undoubtedly alters how children learn inside and outside the classroom (Thomas & Rogers, 2020). Today's learners are habitual in using their cell phones and computers as information centers rather than instructors and textbooks (Al-Maawali, 2020). These technologies have improved student interaction, and more significantly, they have created a digital age that

seeks information outside of the four walls of the classroom. With advancements in technology happening at an incredible pace, it is no surprise that educators are exploring new and innovative ways to enhance learning experiences. From virtual classrooms, interactive whiteboards, and online assessments to distance learning programs, there seems to be no end to how tech can revolutionize education. This observation was described by Napal et al. (2020) in their discussion on the rising importance of utilizing technology in educational settings. They gave educators additional duties, such as developing inventive ways to use technology in the classroom. According to Leow and Neo (2023), this digital environment has changed the responsibilities that both instructors and students play. Instead of being the source of information, teachers are seen as guides for their students. On the other hand, learners must acquire a set of abilities, including teamwork, global citizenship, and a new attitude for the digital age. Overall, technology has transformed education for the better. It has made learning more engaging and compelling, allowing teachers to support their students better. Individuals increasingly rely on technology to acquire answers and information in the contemporary digital era. Therefore, technology can effectively teach ESL (English as a second language). The use of technology in ESL classrooms has the potential to enhance language learning outcomes and promote engagement and motivation among students. Liu and Huang (2018) argued that technology can be used to enhance students' language skills, such as writing, speaking, listening, and reading. For instance, language learning software can provide practice in these skills and offer instant feedback. Not only this, but technology can also facilitate communication and collaboration among students and between students and teachers, even in online or remote learning environments, with the help of videoconferencing tools that can allow for real-time communication and collaboration (Zhao & Bryant, 2019).

While several learning theories have been proposed as explanatory frameworks for learning in the digital age, Connectivism is regarded as one of the most well-known theories (Goldie, 2016). Siemens (2017) defined Connectivism as a learning paradigm that sheds light on the activities and learning abilities students would need to demonstrate in the digital age. Corbett and Spinello (2020), in a similar spirit, underlined that "from its early origins, Connectivism was presented as an alternative educational theory more congruent with the dynamic world and technological advances impacting learning and the nature of information and its sources" (p.2). The framework suggests that learning can be made more effective, collaborative, and learners-centered by inculcating Connectivism in the classrooms; therefore, it has vast implications in the context of language learning and teaching, more specifically in teaching English as a second language as English is widely taught and learned as a second language in Pakistan. The use of English is prevalent in higher education, business, government, and media, making it a necessary skill for many Pakistanis seeking professional and academic advancement. There will be more constraints as well as possibilities for learners in Pakistan, a country that seeks to adopt English as a second language. It has never been more significant to aid students in becoming more proficient users of English as a second language in the globalized and more digitalized society of the 21st century. Connectivism theory can be used in the English as a Second Language (ESL) environment and other academic fields since it attempts to socially link learners and advance digital learning advancements (Aksal et al., 2013). The Connectivist approach aims to fill those shortcomings in the present. To achieve significant learning processes and results, educational settings should be prepared to take chances and adopt innovative learning technology (Utecht & Keller, 2019). So, this technique is more critical than ever owing to technological improvements and the fact that it satisfies student demands while providing valuable guidelines for instructors (Tham et al., 2021). Connectivism has used sharing in "public dialogue" and dispersed knowledge (Utecht & Keller, 2019), which can be expanded to sharing ideas, activities, or behaviors to learn

writing. In contrast, writing within the framework of cognitive theories primarily entails employing an individualized approach to the development of material through cognitive procedures (Hayes & Flower, 1980). The issue involves incorporating reflective cognitive processes, which are inherent to the writing process, into participatory pedagogies within the context of e-learning.

One of the main benefits of using Connectivism in teaching writing skills to ESL learners is that it provides a learner-centered approach to education. According to Siemens (2006b), the founder of Connectivism, learning is a process that occurs when learners connect and with the resources available to them. This approach allows teachers to create a learning environment that caters to each learner's unique needs and interests. This can improve learner engagement and motivation, which is particularly important for ESL learners who may struggle with the cultural and linguistic challenges of learning a new language. Another significant benefit of using Connectivism in teaching writing skills to ESL learners is the emphasis on authentic and relevant learning experiences. According to Siemens (2012), Connectivism emphasizes the importance of learning in real-world contexts, where learners can apply their knowledge and skills in meaningful and applicable ways. By incorporating real-world examples and scenarios into writing assignments, teachers can help ESL learners develop their writing skills in a way relevant to their lives and experiences. Collaborative learning is another essential aspect of Connectivism that can benefit ESL learners. Another significant benefit of using Connectivism in teaching writing skills to ESL learners is that it encourages the use of technology. Connectivism emphasizes the importance of digital literacy skills, which are increasingly important today (Siemens, 2017). By incorporating digital tools and platforms into writing assignments, ESL learners can develop their digital literacy skills while improving their writing skills. For example, using collaborative writing platforms like Google Docs can allow ESL learners to receive immediate feedback from their peers and teachers, which can help them identify areas for improvement and refine their writing skills (Cobb & Divine, 2016). According to Drexler (2010), Connectivism emphasizes the importance of collaboration and social learning. Using collaborative writing tools and activities, ESL learners can work together to improve their writing skills, provide feedback, and learn from each other's perspectives and experiences. This can be particularly valuable for ESL learners who may benefit from the social support and interaction that collaborative learning provides.

Teaching English as a Second Language to the 'Digital Natives' of Pakistan

The advent of digital technologies has revolutionized various aspects of our lives and modes of communication. According to Vitvitskaya et al. (2022), individuals in the current era of information technology are commonly referred to as "digital natives" due to their extensive exposure to digital devices. They further assert that the introduction of these digital devices appears to have altered the cognitive composition of the students, and learners nowadays possess distinct cognitive processes and information-processing methods compared to previous generations. The disparities extend beyond what educators often acknowledge or comprehend. The perspectives of Vitvitskaya et al. (2022) emphasize the significance of incorporating digital educational technologies into English language instruction for ESL learners who are immersed in a digital environment. According to and Haba (2023), there is a shared perspective that in the 21st century, the use of everyday language is closely connected to technology. Consequently, acquiring language skills through technology has become an integral part of life, which holds significant implications for Applied Linguists, especially those interested in various aspects of second language acquisition. Additionally, they highlighted that progressive individuals within the field have proposed that the concept of communicative competence has transformed in a contemporary society where contact occurs both with computers and with other

individuals via computer-mediated means. The researchers argue that there have been significant shifts in both the natural environment and the modes of communication. The advent of recent technology has seemingly transformed the world into a global community, wherein English has emerged as a widely used language for communication on a global scale. To effectively instruct the youthful denizens of the interconnected world, it is imperative to utilize the pedagogical resources that align with the technological proficiency of the "digital natives" within this global community.

Literature Review

Connectivism is a contemporary learning theory introduced by George Siemens and Stephen Downes in response to the transformative impact of the digital age. This theory represents a significant shift in how we perceive and approach learning (Downes, 2016). Connectivism emphasizes the decentralization of knowledge and subsequently redefines the concept of learning (Bell, 2011; Ozan & Kesim, 2012; Barnett et al., 2013; Alzain, 2019). Connectivism can be described as a form of social learning facilitated through networked connections (Duke et al., 2013). The word "Connectivism" was devised by Siemens (2012) to describe learning within specific networks. According to Connectivism, learning is being able to create and traverse these networks as information is dispersed among them (Downes, 2022). This theory strongly emphasizes the impact of the digital era on education, with relevance to teaching and learning English as a Second or Foreign Language. For example, proponents like Veselá (2020) argue that applying Connectivism principles in EFL instruction involves focusing on aspects not commonly addressed in conventional approaches like Communicative Language Teaching (CLT). These aspects include giving concurrent attention to diverse opinions, viewing English language learning as a process of making connections between information resources, recognizing the role of both human and non-human tools in English teaching, emphasizing the currency and accuracy of English learning, and acknowledging the supportive and facilitative role of the teacher – elements often overlooked in the CLT approach. Kultawanicha *et al.* (2015) suggest that the Connectivism theory can potentially enhance learners' motivation by enhancing their learning experiences. Additionally, Samani and Noordin (2020) believe integrating web-based technologies into training can boost motivational outcomes. Ultimately, Kowsari et al. (2023) posit that using web-based technologies in education and learning can improve academic self-efficacy, increase task value, and enhance learning outcomes through increased social interaction, updated learning resources, and active efforts to acquire new knowledge.

Connectivist Characteristics

Research studies have investigated the practical implementation of Connectivism and have illuminated its core characteristics in educational contexts. A study by Kowsari et al. (2023) utilized Connectivism as a guiding framework for teaching in an online graduate educational setting; the researchers identified four key characteristics of Connectivism during the action research. Mackness et al. (2010) define autonomy as the inclination toward self-directed learning, where learners can choose where, when, how, with whom, and even what they want to learn—the concept of self-direction positions Connectivism within andragogy and other adult learning paradigms. Researchers have explored the stages of self-direction and established frameworks rooted in Connectivism to increase self-directed learning among students (Bentley et al., 2014; Conradie, 2014; Fouladchang, 2018). Connectedness, also known as interactivity, signifies the capability to establish connections with others and is rooted in the networking facets of Connectivism. Research on connectedness within the context of Connectivism is relatively limited (Burch & Harris, 2014). However, it has been explored in the context of communities of practice

(Cleary, 2021) and personal learning networks (Richardson & Mancabelli, 2011). Downes (2019) underlined that diversity emphasizes the accessibility of several perspectives for learners. Diversity is shaped by individual experiences and their different cultural and ethnic backgrounds. The principle of openness highlights the capacity and willingness to disseminate knowledge or information. Dziubaniuk et al. (2023) highlighted that active participation is crucial for knowledge building in Massive Open Online Courses (MOOCs). Recent studies have explored the importance of openness in MOOCs and concluded that some students who actively follow the course are not extensively involved with other students. However, these less engaged students still benefit from the openness of their peers and participate more when encouraged (Bhaskar et al., 2021 & Khushk et al., 2023). Additionally, openness may be a more technical phrase that describes the type of learning materials utilized in the course (Alam, 2023).

Material and Methods

Research Design

To determine the impact of the Connectivist Learning Approach on the writing skills of Pakistani ESL learners, this study uses a Quantitative research design, thus underlining the positivist paradigm of the research. The current study uses a non-equivalent pretest-posttest quasi-experimental design to record the performance gaps between the experimental and control groups of L2 learners. This study divided two intact groups into control and experimental groups using a quasi-experimental approach. The researcher assessed pre-test and post-test scores and variances between the tests. The method offered a methodical and organized approach to evaluating the efficacy of the Connectivist learning model on ESL learners' writing skills. Thus, this design facilitated the researcher to make informed conclusions on the intervention's impact on the variables under investigation. Moreover, this methodology allows researchers to conduct intra-group comparisons over a period, thus yielding significant insights into the causal link between the Connectivist learning model and the writing proficiency of ESL students. Moreover, the IELTS writing test was used in the current research to measure the writing competencies of ESL students in pre and post-tests.

Grading Rubrics

The writing performance test was administered to both groups (the CG and the EG) at the pre- and post-test phases of the study in accordance with the requirements of the study. The two trained markers in this study evaluated the pre- and posttests of both the control group (c-group) and experimental group (e-group) using the English as a Second Language (ESL) Composition Profile, a frequently used rubric by researchers of ESL writing testing and evaluation, developed by Jacobs, Zingraf, Wormuth, Hartfiel, and Hughey in 1981 as cited in (Hamp-Lyons, 1984). Jacobs ESL Composition Profile is one grading scale that considers the writing components. Each of the five writing quality rating dimensions—content (30 points), organization (20 points), vocabulary (20 points), language usage (25 points), and mechanics (5 points)—is given a distinct weight in the rubrics used to grade essays.

Sample

The sample comprised 90 ESL undergraduate learners studying at the Islamia University of Bahawalpur. They were divided into two intact classes and randomly selected as control and experimental groups.

Analysis

It is a statistical method used to assess the impact or effectiveness of an intervention, treatment, or program. A pretest is a measurement taken before the intervention or treatment is applied. It serves as a baseline measurement to understand the subjects' or participants' initial status or condition. A post-test is a measurement taken after the intervention or treatment has been implemented. It helps evaluate the changes or effects that occurred due to the intervention. If there is a significant variance between the pre- and post-test measurements, it suggests that the intervention had an impact. Factors such as randomization, control groups, and sample size are essential for ensuring the reliability and validity of the analysis.

Table 1
Pre- and post-test of Control Group

Test	Mean	N	Std. Deviation	Std. Error Mean
c-group pretest	45.78	45	16.461	2.454
c-group posttest	57.64	45	16.996	2.534

The above table reveals the difference between the results from the pre- and post-test regarding the control group. The scores of the c-group pre-test indicated outcomes as (M = 45.78, SD = 16.461), while the results in the post-test were (M = 57.64, SD = 16.996). The result shows a minor difference in the post-test result.

Table 2
Pre- and post-test of Experimental Group

Test	Mean	N	Std. Deviation	Std. Error Mean
e-group pre-test	43.62	45	14.790	2.205
e-group post-test	71.98	45	15.345	2.288

The above table reveals the difference between the results from the pre- and post-test about the control group. The scores of the control group pre-test indicated outcomes as (M = 43.63, SD = 14.790), while the results in the post-test were (M = 71.96, SD = 15.345). The results show significant improvement in post-test results.

Table 3
Paired sample statistics for both groups' pre and post-tests

Pair	Test	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	c-group pretest	45.78	45	16.461	2.454
	e-group pretest	43.62	45	14.790	2.205
Pair 2	c-group posttest	57.64	45	16.996	2.534
	e-group posttest	71.98	45	15.345	2.288

The above table reveals the difference in results from both groups' pre- and post-tests. The scores of the c pre-test indicated outcomes as (M = 45.78, SD = 16.461), while the results in the e pre-test were (M = 43.62, SD = 14.790). The results of the post-test of the c-group indicated outcomes as (M = 45.78, SD = 16.461), while the results in the e-group post-

test were (M = 43.62, SD = 14.790). The comparison between the mean value of the pre- and post-test reveals a statistically minute difference in the control group. However, there is a significant difference in the mean values of the pre- and post-test of the e-group.

Table 4
Samples Test

		Paired Differences (Pair 1 & Pair 2)							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Sig. (2-tailed)
P1	c-group pre-test e- group pre-test	2.156	2.430	.362	1.425	2.886	5.949	44	.000
P2	c-group post-test e-group post-test	-14.333	9.279	1.383	-17.121	-11.546	-10.363	44	.000

The above table reveals the difference in results from the pretest and posttest for both groups. There is a difference in mean, SD, and Std. Error Mean values of both groups in the pretest (M = 2.156, SD = 2.430, and Std. mean .362). However, there is a difference in mean, SD, and Std. Error Mean values of both groups in the posttest (M = -14.333, SD = 9.279, and Std. mean .383).

In both Kolmogorov-Smirnov[a] and Shapiro-Wilk tests, there are .200 and .289 in the pretest, while .200 and .473 in the posttest. However, the sig. Values for the experimental group, pretest and posttest in both Kolmogorov-Smirnova and Shapiro-Wilk tests, are .200 and .289 in the pretest, while .100 and .153 in the posttest. The results show that the pretest and posttest data are normally distributed in the control and experimental groups.

Normality test

A normality test is conducted to ascertain if the sample data has been derived from a population that follows a normal distribution, within a specified tolerance range. A normally distributed sample population is a prerequisite for several statistical tests, including the Student's t-test and the one-way and two-way ANOVA. If the significance value of the Shapiro-Wilk Test exceeds 0.05, then the data follows a normal distribution. When the value is less than 0.05, there is a considerable departure of the data from a normal distribution.

Table 5
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	df	Statistic	Sig.
c-group pre-test	.082	45	.200*	.970	45	.289
c-group post-test	.066	45	.200*	.976	45	.473
e-group pre-test	.074	45	.200*	.970	45	.289
e-group post-test	.053	45	.100	.953	45	.153

*. This is a lower bound of the true significance

a. Lilliefors Significance Correction

The above table represents the p-values of both group's Kolmogorov-Smirnov[a] and Shapiro-Wilk tests.

Discussion

The current research aimed to study the impact of the Connectivist learning method in teaching writing skills to the digital natives of Pakistan. A quasi-experiment approach was used to answer the research question. The study consisted of two separate groups: the experimental and the control group. Each group consisted of 45 participants, and the experiment was continued for three months (12 weeks). The e-group was taught writing skills with the principles and instructions rooted in the Connectivist approach. The experimental group participants were connected, and they worked as nodes and links to disseminate the information within the group. However, the control group adhered to a conventional teaching methodology. Both groups underwent pre- and post-tests to measure the impact of the intervention. Mean (M) and standard deviation (SD) of the pre- and post-test were calculated to see the variation in the scores.

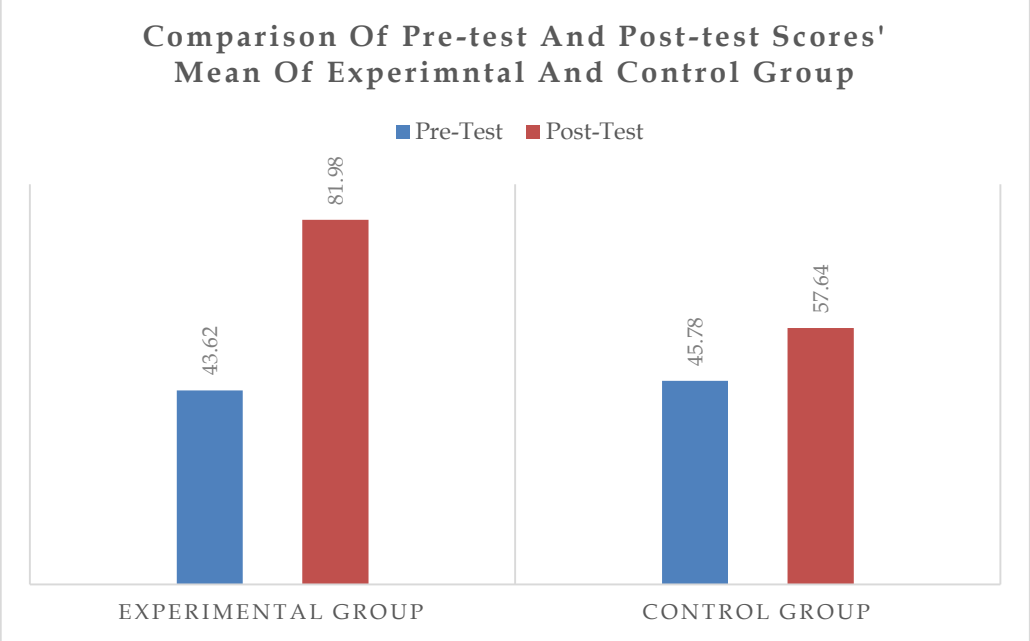

Figure 1 Comparison of Pre- and Post-test Scores' Mean of Experimental and Control Group

The figure above shows the mean values of the pre- and post-tests of the c-group and e-group. The pre-test scores of the c-group indicated outcomes as (Mean = 45.78, SD = 16.461), while the results in the post-test were (Mean = 57.64, SD = 16.996). The results show minor improvement in post-test results. However, the scores of the pre-test of the e-group indicated outcomes as (Mean = 43.63, SD = 14.790), while the results in the post-test were (Mean = 81.98, SD = 15.345). The statistical analysis demonstrated a significant improvement in the writing performance scores of the e-group compared to the c-group. Therefore, the findings of the quasi-experimental study demonstrate a significant impact of the Connectivist Learning Approach (CLA) on the writing proficiency of Pakistani English as a Second Language (ESL) learners. The collection of quantitative data involved the administration of pre- and post-intervention evaluations, which aimed to evaluate various aspects of writing skills, including organization of ideas, content, language usage,

vocabulary and mechanics and overall the ability to express. The analysis of the aspects of writing skills is given below:

- **Organization:** The organizational structure of the written work was a key aspect evaluated in this study, and the results suggest that CLA positively influenced the organization of ideas and the overall coherence of the participants' writing. The e-group exhibited a notable enhancement in the organization and structure of their written work. CLA's emphasis on collaborative learning appeared to foster a more systematic presentation of ideas, resulting in a more coherent and logically structured composition. The collaborative nature of CLA was reflected in the improved organization of written work. Group activities and peer discussions encouraged learners to organize their ideas more systematically, creating a flow evident in their compositions' structure. Further, using technology in CLA, specifically online platforms for collaborative writing, contributed to an organized and coherent presentation of ideas. Learners utilized digital tools to collectively structure their writing, reflecting a positive impact on the organizational aspects of their compositions. In short, participants who received CLA instruction showcased improved coherence and cohesion in their writing. Collaborative writing tasks and online discussions, integral components of CLA, seemed to enhance learners' understanding of how ideas should be interconnected, leading to more organized and cohesive written expression
- **Content**: The Connectivist Learning Approach (CLA) significantly impacted the content development of Pakistani ESL learners' writing skills. The quasi-experimental study revealed that learners exposed to CLA principles demonstrated a substantial improvement in the quality of their writing. They developed new ideas and themes in writing due to collaboration with their fellows. This diversity was celebrated and adopted by the ESL learners, and they developed a wide range of ideas that directly or indirectly improved the content of their written works.
- **Language Usage**: Language usage encompasses grammar, syntax, and the effective conveyance of ideas. The study results suggest that CLA positively influenced language usage among Pakistani ESL learners. The experimental group demonstrated improved grammatical accuracy in their writing. Collaborative tasks and peer interactions in CLA provided learners with opportunities to receive feedback on grammar, contributing to a more refined and accurate use of language. Further, CLA's emphasis on learner autonomy and collaboration empowered participants to express themselves more freely. The language used by the experimental group was grammatically accurate and more expressive, indicating a positive impact on the learners' ability to convey their thoughts effectively.
- **Vocabulary**: Vocabulary use is a critical component of writing skills, and the study indicated that CLA had a substantial impact on the richness and diversity of vocabulary employed by the learners. The experimental group exhibited a more enriched and varied use of vocabulary. This improvement was attributed to the interactive and collaborative activities inherent in CLA, providing learners with opportunities to explore and incorporate a broader range of words into their writing. Moreover, CLA's focus on collaborative learning facilitated effective communication among learners. The diverse vocabulary used by participants not only enhanced the quality of their writing but also contributed to more nuanced and expressive communication of ideas
- **Mechanics:** Mechanics, including punctuation, spelling, and other technical aspects of writing, were evaluated to assess the overall quality of the participants' written work. The participants in the experimental group demonstrated improved mechanics

in their writing. While the focus of CLA is on broader language skills, the attention to collaborative learning and peer feedback also contributed to enhanced attention to detail in mechanics.

- **Overall Writing Proficiency:** Holistic scoring of the writing samples confirmed a statistically significant improvement in the overall writing proficiency of the experimental group. The CLA intervention positively influenced multiple dimensions of writing, indicating a comprehensive enhancement in language proficiency.

Conclusion

In conclusion, the Connectivist Learning Approach significantly impacted the writing skills of Pakistani ESL learners across multiple dimensions. The study provided evidence that CLA, with its focus on collaboration, technology integration, and learner autonomy, positively influenced content development, organizational structure, vocabulary use, language usage, and even writing mechanics. The experimental group, exposed to CLA principles, showed remarkable improvement in the organization and coherence of their writing. The vocabulary employed by these learners was more sophisticated and diverse, reflecting the positive influence of collaborative learning. Language usage, including grammatical accuracy and expressive language, was notably enhanced among those who received CLA instruction. These findings hold significant implications for ESL educators, suggesting that integrating CLA principles into instruction can effectively elevate writing skills among learners. As language proficiency is a multifaceted skill, the holistic approach of CLA appears to address various aspects simultaneously. The study recommends further exploration of CLA in diverse ESL contexts and encourages educators to consider its application in their instructional practices.

Implications of the Research

The findings of this research have significant implications for educational policymakers and planners. The positive impact of the Connectivist Learning Model on writing skills suggests that integrating such models into national education policies could enhance overall learning outcomes. Policymakers should consider allocating resources and support to implement technology-driven, collaborative learning approaches in higher education institutions. Further, the current research underscores the importance of providing teachers with comprehensive professional development opportunities focused on digital literacy, collaborative learning strategies, and effective integration of technology in the classroom. However, the positive outcomes observed in writing skills suggest a need for revisiting and adapting curricula to align with the principles of the Connectivist Learning Model. Curriculum designers should explore ways to integrate collaborative, technology-enhanced learning experiences that promote critical thinking and creativity. Furthermore, this research emphasizes the positive impact of the Connectivist Learning Model on student engagement and motivation. Educators and institutions should adopt more student-centric learning environments that leverage digital tools and collaborative approaches. The research focused on the specific context of Pakistani digital natives, but the implications extend to diverse cultural and educational contexts. Educators and researchers should be mindful of cultural nuances and adapt the Connectivist Learning Model to suit local contexts. This may involve incorporating culturally relevant content and language considerations and addressing specific challenges or opportunities unique to each educational setting.

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