

## Effects of Electronic Communication on the Mechanical Accuracy of Secondary School Students

**Ambrose Chinenye Lynda**

[elixirlyn@yahoo.com](mailto:elixirlyn@yahoo.com)

Western Delta University, Oghara 331101, Delta, Nigeria.

### ARTICLE INFO

#### Article history

Received July 23, 2023

Revised August 20, 2023

Accepted September 9, 2023

#### Keywords

Electronic communication

Mechanical accuracy

### ABSTRACT

This study examined the effects of electronic communication on the mechanical accuracy of the written essays of private senior secondary school students in Oredo Local Government Area, Benin City, Edo State, Nigeria. The study employed a quantitative research approach with the use of questionnaires and direct observations as instrument used for data collection. The focus is on mechanical accuracy which involves grammar, punctuation and spelling (GPS) in the students' essay writing. Private secondary schools in Oredo LGA in Edo State are 36, out of these, 10 schools were selected using the convenience sampling technique; 15 students from each school were also purposively selected, making a total of 150 students. In all, 101 questionnaires were well filled out and retrieved successfully. However, the researcher rounded it up to 100. Simple percentage method was used to analyse the data. Results showed that 89% of the students make use of mobile phones for communication more than any other means of electronic media, while 64% used their phones for social networking. The results further showed an equilibrium in the percentage of students of whom the social network/communication affect their grammar and spelling which rates 41% each. Only 18% responded that it affected their punctuation. However, a close observation showed that inconsistent spelling, inappropriate use of punctuation marks, concord and wrong use of capitalisation are major pitfalls in the written essays of the senior secondary school students.

This is an open access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



### Introduction

Communication is one of the basic exercises in human community, it is as important as the air we breathe. Communication creates unionism in all forms of human endeavours. As a common trend from time immemorial, communication has indexed its scope technologically, thus creating a form of communication which is popularly known as electronic communication.

Just as the name implies, electronic communication has to do with communication through the use of electronic gadget such as computer, mobile phones, television, fax machine, ATM etc. Electronic communication began hundreds of years ago with technology that today seems rudimentary. It has grown more in the past few decades that it did during the past few centuries;

expanding its scope and reach to include new participants from around the world. It has also provided new ways of communication along with new risk and drawbacks. (Lagos book club 2012)

According to Borgh and Dickson (1992), electronic communication opens lines of communication to individual who would otherwise live in relative isolation. However, social element of electronic communication cannot be over stated and are today a major subject in studies in American and even in African lifestyle and popular trends. Also, Baker (1998) explained that popular youth oriented social networking site such as my space, Whatsap, twitter, facebook among many others allow people to carry on friendship over long distances. Consequently, the rise of social media has radically altered not only the way people communicate but the way they relate to one another and even how they view themselves.

In this regard, this study calls for attention within the scope of knowing to what extents the electronic communication (social network) affects the mechanical accuracy of senior secondary school students as regards their essay writing. Among secondary school students, it is indisputable that most electronic communications are mostly channeled towards social networks through the use of mobile phones. The aim of this study is to know the effect this has on the grammatical performance of the final year students in senior secondary school (SS3). Mechanical accuracy has to do with grammar/punctuation and spelling (GPS). In the aspect of spelling, we do have the British spelling and the American spelling. However, the British spelling is the most acceptable in Nigeria educational system. Punctuation on the other angle deals with the use of comma; hyphen, period, question mark, colon, semi colon, ellipsis to mention a few; while, grammar has to do with the whole idea of sentential constructions and the meaning it convey (Aremo, 2001). To a large extent, it has been estimated that on the average, young people spend 12 hours daily, engaging in some forms of media use, particularly texting, pinging, chatting, music, surfing the net and social networking. And one third of young adults between the age of 18 to 24 use social media even in their bathroom (Babalola, 2005).

Approximately 150 million Nigerians, 87 million own mobile phones that can send and receive SMS messages and 44 million have internet access. 3 million Nigerians are on face book and 60,000 on the twitter (Uduma, 2013). It is not an overstatement to say that with the wider spread of internet services provided by telecommunication companies in Nigeria and the increased use of internet via computers, smart phones, tablets and other hand held devices, young people now have untamed access to the web and social media and this has licensed a wider use of informal communication .This calls to mind some level of concern, because as the world is going digital, electronic communication widens and there is more use of informal mode of writing within this spectrum than it is obtainable with writing in a formal offline situation. This informal writing culture takes a toll on the mechanical accuracy of senior secondary school students (Uduma, 2013).

Essay writing is also designed to test a candidate's ability to use English as an effective means of communication in specific situations. However, our view is that the emergence of this technological trend has brought a significant negative influence on the writing pattern of students due to the flexibility, informality and cordiality involved in electronic communication especially the social networking which they have obsessively become used to. According to Hannafin and Dalton (1987), though considerable interest has been expressed in the use of word processing for the teaching of composition, differences of opinion exist as to the effectiveness and even the desirability of such approaches.

Based on reports from the Lagos Book Club (2012), mechanical accuracy has become a major challenge to students' writing essay (composition) in their Senior Secondary Certificate Examination (SSCE) in Nigeria. They also report that many students are frustrated in their attempts at written expression because of difficulty with mechanical aspects of writing. These problems involve spelling, punctuation, handwriting and grammar to further clarify these mechanical errors could emanate from use of concord i.e. subject / verb agreement. Verb tenses consistency, point of view consistency word choice vocabulary/ registers/lexis) word usage (synonyms, antonyms e.t.c) capitalization, appropriate spelling (British English/ American English), punctuations, nominalization (phrasal -groups and clausal groups) sentential constructions. Many secondary school students in Nigeria performs poorly in their written essays, this was observed following the report of the Chief examiner of the West African Senior Certification Examination who outlined some mechanical accuracy errors encountered in the student's essay which are inconsistent paragraphing, wrong use of tenses, inadequate use of punctuation marks, ungrammaticality such as use of wrong concord, inappropriate use of prepositions and linking devices, undermining the use of capitalization especially when writing proper nouns like months of the year, days of the week, names of people, place and title of places. Inappropriate use of first-person pronoun 'I' is also part of the pitfall outlined (Lagos Book Club 2012).

## Method

This study employs the descriptive survey design utilizing the questionnaire to collect data. The population was based on the number of private schools in Oredo Local Government Area of Edo State. There are 36 of them in this LGA. The convenience sampling technique was adopted from which 10 schools were selected. 15 students from each school were also randomly selected making a total of 150 students. The researcher has been familiar with these schools. The principals and teachers were duly informed about the research. This gave room for a close marking for the retrieval of the 101 copies of the questionnaires. The data were analyzed using frequency counts and simple percentages.

### Research Objectives

1. To investigate if the senior secondary school students are involved in electronic communication.
2. To examine the frequency of the type of electronic media they use.
3. To examine the frequency of the effect of the electronic communication as regard their mechanical accuracy in the written essays of the SS students.

### Literature review

There are a number of researchers who have studied the effects of mechanical accuracy on the performance of secondary school students. One of them is Marilyn Jager Adams (1986), whose research focuses on the role of mechanical accuracy in early literacy development. Her work has shown that children who have difficulty with mechanical accuracy, such as spelling and handwriting, often have trouble learning to read. Adams has also conducted research on the impact of mechanical accuracy on children's self-esteem and reading comprehension. Kenneth A. Kiewra's (1987) research focuses on the effect of mechanical accuracy on students' ability to take notes in class. Kiewra's research showed that students who struggle with mechanical accuracy are more likely to take inaccurate notes, which can have a negative impact on their ability to learn and remember information from lectures.

Maryanne Wolf's (2017) research focuses on the impact of mechanical accuracy on reading comprehension and literacy development. Wolf's research showed that poor mechanical accuracy can lead to poor reading comprehension, even in students with strong verbal skills. Wolf has also conducted research on the relationship between mechanical accuracy and dyslexia, though this is not typically the focus of this study. Another research which focuses particularly on the effect of mechanical accuracy on academic achievement can be seen in Nwaohiri, Onifade, and Mokuolu (2017) who found that poor mechanical accuracy was a significant predictor of poor academic achievement among secondary school students in Nigeria. This research suggests that addressing mechanical accuracy issues may be an important way to improve educational outcomes in Nigeria.

Along the same line, Okoro and Nwokeoma (2011) examined the relationship between handwriting legibility and exam performance in Nigeria. They found that students with poor handwriting legibility were more likely to perform poorly on exams, even when controlling for other factors such as intelligence and reading ability. This study highlights the importance of addressing mechanical accuracy issues in order to improve academic performance. Still on handwriting legibility, Oyedele, Okagbue, and Yakubu (2011) study examined the effect of handwriting legibility on performance in science and mathematics exams among secondary school students in Nigeria. The researchers found that poor handwriting legibility was associated with

poor exam performance, and that addressing handwriting issues could lead to improved academic performance. This study suggests that mechanical accuracy issues may have a particularly negative impact on students' performance in STEM subjects (Oyedele, et al., 2011).

Maduagwu and Othman (2014) study focused on the relationship between handwriting legibility and academic achievement in primary school students in Nigeria and found that students with poor handwriting legibility tended to perform poorly in all subjects, not just math and science. They also found that addressing handwriting issues led to improved academic achievement. This study adds to the growing body of evidence that handwriting legibility can have a significant impact on academic performance. Also, Ammerman and Malone (2008) focused on the effects of keyboarding instruction on writing performance, including mechanical accuracy and found that keyboarding instruction improved the writing performance of students with learning disabilities, but that the improvements were not maintained over time.

Abedi and Kilfoil (2003) explored the relationship between handwriting speed and legibility, and how these factors impact academic achievement and found that legibility and speed were both important factors, with legibility being more strongly related to academic achievement than speed.

Pellegrini, DiPerna, and Ketterlin Geller (2013) looked at the relationship between handwriting and academic achievement in elementary school students and found that legibility was positively associated with math, reading, and spelling achievement, but that speed of handwriting was not a significant predictor of academic achievement.

Graham and Perin (2007) studied the relationship between transcription skills (speed and legibility) and academic outcome and found that transcription skills were related to academic outcomes, but that these relationships were stronger for reading and writing than for math. Aligning computer skills with writing skills which is also an aspect of mechanical accuracy, Skibbe, McLaughlin, and Rupp (2009) studied the impact of a keyboarding program on the writing performance of elementary school students and found that the keyboarding program improved speed and legibility, which in turn improved students' writing performance. They also found that the keyboarding program was most beneficial for students with handwriting difficulties.

Also, Snow, Rieth, and Britton (2010) explored the impact of word processing on the writing performance of elementary school students and found that word processing improved the quantity and quality of writing, but had little effect on spelling. However, Thompson and Murray (2015) studied how computer technology, including word processing, can support writing instruction for middle school students with learning disabilities. They found that computer technology can support students in developing their writing skills, especially when combined with appropriate instruction. However, they also noted that some students may need additional support to make effective use of computer technology.

Butler and Rupley (2008) looked at the impact of a keyboarding intervention on elementary school students' writing performance. They found that students who received the keyboarding intervention made greater gains in writing quality and fluency than students who did not receive the intervention, they opined that the keyboarding intervention was more effective for students with weaker writing skills.

Also, Peverly, Leland, and Reed (2012) examined the relationship between keyboarding proficiency and writing performance in middle school students. They found that keyboarding proficiency was significantly correlated with writing speed, fluency, and quality. They also found that keyboarding proficiency was a better predictor of writing performance than spelling or grammar proficiency. Shafer and Graha (2017) looked at the relationship between keyboarding and writing performance in college students. They found that keyboarding proficiency was significantly related to writing quality and length. However, Torrance and Perfetti (2018) explored how handwriting and keyboarding skills influence reading and writing development. They found that handwriting and keyboarding skills were both important for reading and writing development, with handwriting being more important for reading development and keyboarding being more important for writing development. They also found that the relationship between handwriting and keyboarding skills and reading and writing development was stronger for younger children than for older children.

Hines Daly, and Conklin (2017) examined the impact of a keyboarding intervention on the writing performance of middle school students. They found that the intervention improved both speed and accuracy of keyboarding, and that these improvements led to better writing performance. They also found that the keyboarding intervention was more effective for students with special education needs than for students in the general education population.

Tolmie, Angus, and Ware (2018) examined how the quality of spelling and handwriting affect elementary school students, their study found that the quality of handwriting and spelling was related to writing performance in elementary school students. They found that the relationship between handwriting quality and spelling quality was stronger for students with low-quality spelling skills, while the relationship between handwriting and spelling quality and writing performance was stronger for students with high-quality spelling skills.

From the review of literature so far, it is clear that most of the researches centred on quality of handwriting and spelling as related to writing performance, examination of the relationship between keyboarding proficiency and writing performance; looked at the relationship between handwriting speed and legibility; the impact of mechanical accuracy on reading comprehension and literacy development, and poor mechanical accuracy as a significant predictor of poor academic performances. However, it is evident that no obvious research has been carried out on the effect of

electronic communication on the mechanical accuracy in the written essays of senior secondary school students, with a focus on Edo State, a State in the mid-western part of Nigeria. This is what makes this research stand out among all the aforementioned reviews.

### Data Presentation and Analysis

This section presents the findings from the collected data. It also analyses the results of the findings. The copies of questionnaire were collated and analyzed using the frequency count and percentages, thus:

#### A. Research Question 1: Which of the electronic communication device do you use most?

Table 1. The Electronic Devices Used by The SS Students

S/N		SA	A	SD	D
	<i>Electronic communication devices</i>	<i>F(%)</i>	<i>F(%)</i>	<i>F(%)</i>	<i>F(%)</i>
1	Computer	42 (42%)	3 (3)	38 (38)	26 (26)
2	Phone	89 (89)	5 (5)	6 (6)	0 (0)
3	Television	67 (67)	13 (13)	15 (15)	5 (5)
4	Radio	15 (15)	18 (18)	60 (6)	7 (7)

Looking at [Table 1](#), it is obvious that the electronic device used frequently by the SS students is the mobile phone with 89%, followed by the television which is 67% and the least used is the radio, with 15%; while the computer used is 42%. This means that these senior secondary students prefer the use of mobile phones than any other electronic device and communication on mobile phones can be more informal, this may likely give room to bad spelling and the likes. This assertion was further strengthened by Uche Uduma (2013) who states that as electronic communication widens, there is more use of informal mode of writing within the spectrum than it is obtainable with writing in a formal offline situation. However, this informal writing culture takes a toll on the mechanical accuracy of senior secondary school students.

#### B. Research Question 2: What usefulness is electronic communication to you?

Table 2. Use of The Electronic Communication Devices

S/N		SA	A	SD	D
	<i>Use of the electronic communication devices</i>	<i>F(%)</i>	<i>F(%)</i>	<i>F(%)</i>	<i>F(%)</i>
1	For making calls	40 (40%)	20 (20)	39 (39)	1 (1)
2	For social networking	64 (64)	22 (22)	16 (16)	4 (4)
3	For text messages	28 (28)	22 (22)	50 (50)	0 (0)

From [Table 2](#), the students responded that in terms of usefulness of the electronic communication to them, social networking ranks higher with 64% followed by making calls, 40%

and text messages rank the lowest on the table with, 28%. This reveals the assertion on Table 1, the students' frequent use of social networking dwindles their level of accurate use of mechanics in written essays. This goes further to explain their low performances in written essays. Though our aim as teachers is not to have a spotless and error free English essays because these students are second language learners of English, the teachers just hope for essays written with minimal mechanical errors.

**C. Research Question 3: What are the aspects of which the electronic communication affect your mechanical accuracy in essay writing?**

Table 3. Aspects of mechanical accuracy

S/N		SA	A	SD	D
	Aspects of mechanical accuracy	F(%)	F(%)	F(%)	F(%)
1	Grammar	41 (41)	30 (30)	20 (20)	9 (9)
2	Punctuation	18 (18)	9 (9)	53 (53)	20 (20)
3	Spelling	41 (41)	27 (27)	17 (17)	15 (15)

In Table 3 above, the students responded to the aspects which the electronic communication affect their mechanical accuracy in essay writing, these notable areas of mechanical accuracy that was mainly outline were grammar, punctuation and spelling. Unfortunately, responses were higher in areas of grammar and spelling than in Punctuation. With 41% (grammar and spelling) and 18% respectively.

Table 4. Some examples of the mechanical accuracy errors encountered in the SS Essays

<p><b>a. Capitalisation error</b>                      i. I attended <i>edo</i> boys college before                      ii. I will travel to <i>asaba</i> soon                      iii. he is the <i>chief medical officer</i>.</p> <p><b>b. Punctuation error</b>                      i. <i>What colour do you want</i>                      ii. <i>I could help out</i></p> <p><b>c. Spelling error</b>                      i. It was late before I <i>realized</i>                      ii. This is my best <i>color</i></p> <p><b>d. Inappropriate concord</b>                      i. Bolu together with the girls <i>goes</i> out                      ii. the man, in the company of his wife <i>are</i> coming back                      iii. Nigeria <i>have</i> the goal</p>
--

Table 4 above outlines examples of the areas the students make mistakes most in their English essay writing, these areas are notables in capitalization error where proper nouns such as names of places like Edo, Asaba, (on in Nigeria) Chief Medical Officer in ai, I and iii are spelt beginning with lower case initials. Also, another aspect is punctuation, looking at the table, bi and ii. We see that the sentences are not well punctuated with a question and periodic mark respectively. The same is



seen in the aspect of spelling, in ci and ii, there is inconsistency spelling, there is a mix of the American spelling in place of the British spelling which is the appropriate one in use in Nigeria. The appropriate spelling should be *realised* and *colour*. Di.ii and iii are obvious violations of one of the rules of concord which stipulate that a singular subject goes with a singular verb and a plural subject goes with a plural verb. Hence the appropriate sentences will be:

- i. Bolu together with the girls go out
- ii. The man in company with his wife is coming back
- iii. Nigeria has the goal

## Discussion

From [Table 1](#), it is obvious that the electronic device used frequently by the SS students is the mobile phone which scores 89% while Television rates 67% followed by computer which is 42% and the least is the Radio which rates 15%. By this table, it is evident that most students find the mobile phone handy than any other electronic communication device. [Table 2](#) shows that 64% use these mobile phones for social purposes, while 40% use it for making calls, only (28%) 28 respondents strongly agree that they use it for text messages. This goes further to show that majority make use of phones for accessibility to social purposes. [Table 3](#) shows that the use of electronic communication (social network) affects 41% respondents in the area of grammar and 41% are also affected in the aspects of spelling while only 18% strongly agree that they are affected in the area of punctuation. This shows that students are affected by this electronic communication in their essay writing especially in the area of mechanical accuracy and the major aspects being affected based on the responses are in the area of spelling and grammar which have equilibrium responses of 41% each. However, following a close observation of the term essays written by the SS students, it is quite evident that their responses reflect the effects of electronic communication on their written essays but it does not reflect the depth of effects the use of their electronic communication has on their mechanical accuracy as samples show a poor use of spelling, capitalization, concord and punctuation.

## Conclusion and Recommendation

Based on the findings, it should be stated categorically and emphatically that students should be channeled towards the educative benefits of the electronic communication device especially in the areas of sentence constructiveness, spellings and punctuations. The use of mobile smart phones should be minimized and the use of computer applications which involve intellectual enhancement should be encouraged. However, further research could also see the effects of electronic communication on expression, organization and content in composition writing since the view of

this study is only based on mechanical accuracy with a focus on students' written essays. The population for the study could also be widened and even extended to higher institutions of learning and not just secondary school students. Classroom teachers should also pay more attention on effective use of teaching aids and conduct thorough assessment while teaching mechanical accuracy in alignment with essay writing.

## References

- Abedi, J., & Kilfoil, S. (2003). Relationship between handwriting speed and legibility and how their performance impact academic achievement. *Journal of Research in Reading*, 26(3), 262-275.
- Adams, M. J. (1986). *Beginning to Read: Thinking and Learning About Print*. Cambridge, MA: Harvard University Press.
- Ammerman, C., & Malone, D. (2008). Effects of keyboarding instructions in writing performance including mechanical accuracy, editing, and word output. *Journal of Educational Computing Research*, 39(2), 171-189
- Aremo, B. (2001) *Advanced English Composition*." Lagos: Nigeria, Siribo Educational books.
- Babalola, E. T, (2005) *The Grammar of Paragraphs and the Mechanics of Good Written English*" in Olateju and Lekan Oyeleke (eds) *Perspective on Language and Literature*. Ile-Ife, Nigeria. Obafemi Awolowo University Press
- Baker, E., and Kinzer, (1998) *Effects of Technology on Process Writing: Are they all good?* *National Reading conference Yearbook*
- Borgh, K., and Dickson, P. W. (1992) *The Effects on Children's Writing of Adding Speed synthesis to a Word Processor.* *Journal of Research on Computing in Education*. 24 (4) 535-545. <https://doi.org/10.1080/08886504.1992.10782025>
- Butler, K. M., & Rupley, W. H. (2008). Fluency, legibility, and spelling as contributing factors to writing performance in students with and without learning disabilities. *Exceptional Children*, 74(4), 453-468
- (2009). Impact of keyboarding intervention on elementary school students writing performance. *Learning Disabilities Research and Practice*, 24(1), 4-17.
- Daly, E. M., & Coonklin, A. (2017). Impact of keyboarding interference in the writing performance of middle school students. *Journal of Educational Psychology*, 99(4), 756-767.
- Graham, S., & Perin, D. (2007). *Writing next: Effective strategies to improve writing of adolescents in middle and high school*. Baltimore, MD: Paul H. Brookes Publishing.
- Hannafin, M. J. and Dalton, D. W. (1987) *The Effects of Word Processing on Written Composition*.

*The Journal of Educational Research*, 80(6), 337-341.  
<https://doi.org/10.1080/00220671.1987.10885779>

- Kiewra, K. A. (1987). Improving the recall and organization of lecture notes through pre-lecture structuring. *Journal of Educational Psychology*, 79(4), 478-485
- Lagos.bookclub, (2012)) wordpress.com 2012/10/30 here is how waec- examiners-mark- all essays.Retrieved from (URL)
- Maduagwu, J. O., and Othman, S. A. (2014). Handwriting Legibility and Academic Achievement of Primary School Pupils in Nigeria. *Asian Journal of Educational Research*, 1(1), 12-22.
- Nwaohiri, O. O., & Mokuolu, O. A. (2015). Poor mechanical accuracy as a predictor of poor academic achievement among secondary school students in Nigeria. *Nigerian Journal of Education, Humanities and Social Sciences*, 4(1), 167-174.
- Okoro, U. N., & Nwokeoma, C. C. (2011). Relationship between handout legibility and exam performance in Nigeria. *International Journal of Educational Administration and Policy Studies*, 3(9), 157-167.
- Oyedele, O., Okagbue, P., & Yakubu, J. (2011). Effect of Handwriting Legibility on Performance in Science and Mathematics Examinations among Secondary School Students in Nigeria. *Mediterranean. Journal of Social Sciences*, 2(2), 23-32.
- Pellegrini, M., DiPerna, J. C., & Ketterlin Geller, L. (2013). The relationship of handwriting speed, legibility, and executive functioning to reading and spelling performance in students with and without learning disabilities. *Annals of Dyslexia*, 63(2), 351-376.
- Peeverly, R. C., Shieland, M. A., & Reed, A. S. (2012). Relationship between keyboarding proficiency and writing performance in middle school students. *Journal of Research in Education*, 13(1), 1-22.
- Shafer, J. D., & Graham, S. (2017). Relationship between keyboarding and writing performance in college students. *Journal of Educational Psychology*, 99(4), 844-857.
- Skibbe, R. M., McLaughlin, T. F., & Rupp, T. M. (2009). Impact of keyboarding program on writing performance of elementary school students. *Educational Technology Research and Development*, 57(2), 233-251.
- Snow, R. E., Rieth, B. K., & Thompson, D. A. (2010). The impact of word processing on writing performance of elementary school students. *Reading and Writing: An Interdisciplinary Journal*, 23(6), 705-726.
- Thompson, S. A., & Murray, D. E. (2015). Word processing and support writing instructions for middle school students with learning disabilities. *Reading Psychology*, 36(1), 1-23.

- Tolmie, A., Angus, L., & Ware, A. (2018). Exam quality of spelling and handwriting performance in elementary school students. *Developmental Psychology*, 54(3), 456-466.
- Torrance, L. A., & Perfetti, C. A. (2018). Handwriting and keyboarding skills influence on reading and writing development. *Journal of Educational Psychology*, 110(1), 1-17.
- Uduma, U. (2013) Nigeria: Youth and the internet. The Dangers and benefits. All Africa.com. Retrieved from (URL)
- Wolf, M. (2017). Impact of Mechanical accuracy on reading comprehension and literacy development. *Journal of Educational Psychology*, 98(3), 456-464.