Effects of Auto-Correction on Students' Writing Skill at Three Different Universities in Sulaimaneyah City

Kozhin Omer Ismael
English Department, College of Basic Education, University of Sulaimani, Sulaymaniyah, Iraq
&
English Department, Komar University of Science and Technology, Sulaymaniyah, Iraq

Kochar Ali Saeed
English Department, Komar University of Science and Technology, Sulaymaniyah, Iraq
Corresponding Author: kochar.saeed@komar.edu.iq

Airin Shwan Ibrahim
Pharmacy Department, Kurdistan Technical Institute, 46001, Sulaymaniyah, Iraq

Diya Shawkat Fatah
English Department, Komar University of Science and Technology, Sulaymaniyah, Iraq

Abstract
While technology has undoubtedly improved and has become an essential component of modern life, technological advances' consequences have both beneficial and detrimental impacts on students' writing skills in the classroom. Technology has accelerated and simplified work for students, but it has also instilled the belief that there is no need to put significant effort into the texts they write. This study examines the effects of technology and auto-correction on students' writing skills at three different universities in Sulaimaneyah city, Iraq. Case studies and research into the impact of electronic and communication devices on English writing skills among university students has been analyzed to determine the effect of auto-correction on grammar, vocabulary, spelling, and punctuation. Furthermore, the study also aims to show that auto-correction affects students' writing and to compare auto-correction and handwriting to prove that students make mistakes while writing due to technology. In addition, the study examines writing tasks undertaken by students in the English language to assess students' lack of writing skills, particularly in spelling. Finally, the study identifies why students have poor writing skills and corroborate previous research into an auto-corrections negative impact on students' writing abilities.
Keywords: Auto-correction, handwriting, technology, grammar, vocabulary, spelling, punctuation, University of Human Development, University of Sulaimani, Komar University of Science and Technology

Introduction

Writing is frequently referred to as "linguistic literacy", although verbal literacy is essential for success in life, from education to adult employment. Because writing is critical in college and real life, students should be able to write without technical assistance. Individuals who fail to develop these skills may struggle against more qualified candidates when applying for jobs. Writing is the cornerstone of education and is one of the most basic requirements in all academic fields (Heffernan, Linclon, & Atwrill, 2001). In addition, it should be noted that writing is crucial in both the private and professional lives of English as a Foreign Language (EFL) students. Writing technique is the ability to write clearly and concisely, to produce reasoned arguments, and organize facts and ideas. Rapid technological advances have led students, particularly those at colleges and universities, to rely heavily on auto-correction to complete their assignments and reports. Unfortunately, many educators believe that modern technological improvements have resulted in a severe deterioration of the writing skills of young people, and the issue of technology and student mentalities has become the focus of intense discussion. Due to the impact of technology, students do not always recognize the importance of truly understanding English language and grammatically correct written expressions. Students want to "click to search" but do not understand the complexity of writing (Purcell, Buchanan, & Friedich, 2013). The option of using spell check in Microsoft Word and PowerPoint allows students to take shortcuts, implying that learning spelling, grammar, and sentence structure is unnecessary because technology can do the task for them. This study shows the effect of auto-correction on the writing skills of university students. Auto-correction is one of the most challenging difficulties facing writers today. In some educational sectors, the increased use of auto-correction on smartphones and other electronic devices has created more difficulties than it has solved. Does a system that constantly corrects all mistakes degrade students' writing skills, regardless of whether they have been taught to write essays and reports in university? There is little doubt that many students have difficulties remembering how to spell correctly, whether taking notes in class, writing essays or when asked on the spot. This study indicates the connection between auto-correction and handwriting, showing the data results and understanding how auto-correction affects students' writing skills, an issue that has been addressed by several researchers and academics namely: (Bromley, 2010; Purcell, Buchanan, & Friedich, 2013; Alhusban, 2016). Nevertheless, this study is principally focused on the impact of auto-correction on students' writing skills and also examines the problems students face in the writing process. In brief, this study aims to help students determine whether auto-correction has affected their writing skills and whether they have problems learning writing skills at the universities in Sulaymaniah.

The study investigates the effects of auto-correction on students' writing skills in three prominent universities in Sulaymaniah. The results should offer current or prospective students validated advice on whether or not to apply and use auto-correction during their university studies and to assess their writing skills. The study tries to answer the following questions:

1. What effect does modern technology have on students' writing skills at some Sulaymaniah universities?
2. How does auto-correction influence English writing skills**?**
3. To what extent does auto-correction affect students' writing skills in some Sulaymaniah universities?

Literature Review
Writing in General

Writing is the process of communicating thoughts and ideas in a readable form by employing symbols such as alphabet letters, punctuation, and spaces (Banwell, 2018). One can write with a pen and pencil (handwriting) or a keyboard (typing). A keyboard is usually found on a typewriter, computer, or mobile phone. Those who cannot see or use their hands can have their thoughts transcribed using voice recognition software (Banwell, 2018). This definition emphasizes that writing is, in principle, a representation of language rather than a direct representation of thought and that spoken language has multiple levels of structure, including sentences, words, syllables, and phonemes (the minor units of speech used to distinguish one word or morpheme from another), all of which a writing system can "map onto" or represent (Olson, 2010). While spoken language has existed since the start of time and can usually be learnt without formal teaching, writing is a technique that has only lived for a relatively short time and must be taught to each generation of children. The Greek development of the alphabet was considered the climax of a long historical progression, with historical narratives of the growth of writing systems focusing on a single attribute, increasing efficiency (David & Olson, 2010). The primary objective of writing is to communicate with others and to elicit a reader's response. It can also be used in writing to help reflect on and grow from personal experiences. While at university, one of the most important ways of measuring a student's progress and learning is through their written work (Lane, 2013).

Handwriting

The act of writing by hand with a pen, pencil, digital stylus, or other devices is known as handwriting. The art, talent, or style of handwriting is known as penmanship. Lockwood (1996) states that "Legible, fast, and personal handwriting will develop most efficiently in intentional writing contexts, much like the other secretarial skills". Mainly, the collective handwriting skill appears to have been reduced by technology. With its typing and texting, the digital era has rendered us unable to scribble even the most important notes in anything resembling penmanship. A third of us cannot read our writing, let alone that of others, according to a poll conducted by the not precisely neutral print and post specialists Docmail (Hamburgh, 2013). According to Bearne (1998), the link between handwriting and spelling is related to kinesthetic memory, or how one absorbs ideas through repetitive movements. Establishing kinesthetic memory for movements is aided by forming letterforms in the air or sand, with paint, with a finger on the table, on paper with a pencil or pen, or even writing out misspellings numerous times. Peters (1985) similarly analyzed perceptuo-motor ability, arguing that precise handwriting goes hand in hand with rapid handwriting, which influences spelling.

Auto-correction

The AutoCorrect feature in Microsoft Word and other products contains a vast list of frequent misspellings and typing errors that it automatically corrects; for example, "hte" will be replaced with "the". Although MLA style writers can benefit from Microsoft Word's AutoCorrect, spell-check, and style-settings features; unfortunately, they can also cause mistakes or get in the way of free expression.

Auto-correct is a software program that detects misspelt words, uses algorithms to determine which words are most likely to have been intended, and then fixes the text accordingly. It is a widely used feature in word processors and various messaging platforms, including Apple, Google, and Microsoft products (Wigmore, 2012). However, their algorithms are far from perfect, especially in auto-correct systems for smartphones, and are frequently more active in facilitating typing on the devices' small keyboards. In addition, auto-correction affects students' writing and spelling; the program can figure out how many mistakes they will make in handwriting and send students a weekly list of 20 unknown words to help them improve their spelling and vocabulary. Nonetheless, when students write their homework in Microsoft Word, they focus less on spelling because auto-correction will correct all of their spelling mistakes for them.

How Computer Applications Affect Students' Writing Skills

Today's young people are unlike any prior generation since they were born into a digital world and have grown up surrounded by digital technology (Prensky, 2001). Students have grown up in this new digital environment utilizing and engaging with a broad spectrum of technology, from television to computers, smartphones, and other digital mobile devices. Since writing is an integral part of success in college and life, students should be capable of writing without technical help and assistance. A failure to master this skill could mean that these individuals will struggle against other more skilled applicants when applying for a job. Therefore, students must learn writing skills to graduate from college and university to succeed in today's highly competitive global economy (Alhusban, 2016). Due to technology, students do not often benefit from learning English language and grammatically correct written speech. Students usually take shortcuts using spell check features in Microsoft Word and PowerPoint, implying that learning spelling, grammar, and sentence structure is unnecessary because technology can do these tasks for them. However, if students do not understand certain key aspects of the writing process, these technical methods will harm them and result in misunderstandings (Purcell et al., 2013). The more students rely on technology to write assignments, the worse their writing ability will become. Students' capacity to articulate their full thoughts is deteriorating, and they cannot think for themselves. Technology generally hides students' misunderstandings and interferes with their learning (Alhusban, 2016). Students cannot think critically and interpret data, synthesize facts, write evidence-based statements, or identify acceptable grammatical and structural errors as a result (Rothman, 2012).

In addition to computer applications, text messaging is another significant technical development preventing students from completing structured written assignments. Texting has been shown to "heighten the propensity among students to adopt due to the significant rise in texting. In their classwork, non-standard uses and contracted forms of English words" (Dansieh, 2011, p. 222). Students' concentration spans become shorter due to texting, causing them to write in minor detail and replace more appropriate words with more specific, less sophisticated words. A study by Dansieh (2011) expanded on this subject by giving examples of terms that have been simplified by using symbols that sound like the syllables of actual words. This activity only creates misspelt words and new words that do not exist in English. When texting, these words and phrases include "4U" means "for you", "B4" means "before", "LOL" means "laugh out loud", "shud" means "should", and "gr8" means "great" (Daisieh, 2011). Since most word processors have spell-checking functionality, students can fix errors immediately and erase, add, or rearrange material.

Word processors save time for students, allowing them to concentrate on more critical aspects such as planning, arranging, and reflecting on their ideas. However, according to Baker and Kinzer (1998), students who write with paper and pencil have a more linear writing method: they brainstorm, outline concepts, write drafts, rewrite, proofread, and then come up with the final edition, while students who register with word processors have no linear process since they combine both of these elements before they come up with the last piece of writing. The relentless advancement in technology has resulted in many improvements in teaching and learning languages. Nowadays, students have access to several applications that aids them in developing their language skills, one of which is word processors as resources that assist students in enhancing their writing skills across a variety of opportunities. New technical five techniques are unmistakably redefining modern writing and writing skills. Today's students are "altering the essence of the English language" by relying on technology to "correct" all of their writing errors (Bromley, 2010).

Related Studies

Abdelrahman (2013) examined how using a word processor might help EFL students at Al-Imam Muhammad Bin Saud Islamic University to improve their writing skills. The study questioned forty male students divided into two sections, each randomly chosen from five sections and allocated to experimental and control groups. Several computer-based approaches, methodologies, and activities such as error checking were applied to fulfil the study's goal. The exact test was given as a writing performance post-test after the experiment. The results revealed significant differences in favour of the experimental group.

Hoomanfard, Meshkat (2015) pulished an article about Writing on a Computer and Using Paper and Pencil the findings revealed that participants spent less time pre-writing preparation in the mechanical condition and took more breaks during the writing process for online planning, according to the quantitative and qualitative analysis of the collected data. In contrast, participants writing with pen and paper typically postponed their evaluation until the end of the writing process. In combination with other studies, these findings can help second language teachers, curriculum developers, and test developers better understand second language writing cognitive processes.

Alhusban (2016) published the results of their research in The Impact of Modern Technological Tools on Students Writing Skills in English as a Second Language. The impacts of electronic and communicative gadgets on English writing among college students are assessed using a case study and current research. According to the findings, students are having increasing difficulties distinguishing between casual and formal writing due to their continual exposure to abbreviated forms of words and programs that practically do the work for them. Two categories of students' writing capabilities were collected and compared to examine writing abilities in creative writing. Sadiku and Krasniqi (2018) published a paper about computers' impact on students' writing skills. Vocabulary is likely to be forgotten if not acquired and used appropriately to give learners language inputs in a natural target language setting. In this regard, today's learners benefit from increased access to various multimedia and technological resources, which improve spontaneous vocabulary acquisition. Movies with subtitles, in particular, can be a valuable tool for bringing pupils closer to realistic real-life communication vocabulary. As a result, past research

has discovered several advantages to watching subtitled movies, including developing vocabulary skills.

Based on the previous studies the researchers realized that there is a gap in this area and the gap is how auto-correction affects Kurdish students writing in three universities in Sulaymaniyah city, figuring out how many mistakes they will make in handwriting. Students in traditional spelling receive a weekly list of 20 unknown words. It is a purpose for improving their writing skills. Still, when students write their homework and write on Words, they do not focus on spelling because auto-correction will correct all spelling mistakes.

Methodology
Research Methods
This study uses a mixed-method approach that integrates both qualitative and quantitative techniques. Qualitative research entails gathering a nd analyzing non-numerical data such as text, video, or audio to better understand ideas, thoughts, or experiences and can be used to gain in-depth insights into an issue or generate new research ideas (Bhandari, 2020). The opposite of qualitative research is quantitative research, which includes collecting and interpreting numerical data for statistical analysis. Quantitative study is widely used in the humanities and social sciences, including anthropology, sociology, education, health sciences and history (Pritha Bhandari, 2020).

Three universities in Sulaimaneyah city are chosen for the data collection. Thirty students are chosen as the sample of the current study and are asked to write two-paragraph essays in the classroom in their handwriting and then type the exact text using auto-correction.

Setting
The research aims to determine the impact of auto-correction on students' writing skills at three different universities in Sulaymaniah. The main goal is to determine whether students make more grammar, vocabulary, spelling, and punctuation related mistakes when writing by hand or when using auto-correction (while typing). In this research, 30 students aged between 18 and 23 from the English departments of three Sulaimaneyah universities, namely: Komar University, UoS, and the University Of Human Development, participated through writing two paragraphs each.

The University of Human Development (UHD) founded in 2008, it is a private, non-profit, national university that focuses on social and health sciences education and human development via teaching, researching, and scholarship. Also, University of Sulaimaneyah (UoS) was founded in 1968, and its main campus is located in Sulaimaneyah, Iraqi Kurdistan. In addition, Komar University of Science and Technology (KUST) is a private university operated by an Administration Council and overseen by Trustees. The university's main campus is in Sulaimaneyah, Kurdistan, Iraq. In 2010, KUST began offering teaching lessons, including an English language summer session (levels 1 and 3).

Ten students from each of the above-mentioned universities are chosen to participate in the current study. The students are chosen randomly and have the right not to participate in the study if they are not willing to. Additionally, they are asked to provide their consent and notice of their complete understanding of the context of the study.

Instruments

To collect data, qualitative and quantitative data collection tools are used. The participants are asked to write two paragraphs about any topic they wish in handwritten form, which they would then type into the computer using auto-correction. The typed text would then be sent to the researcher via email.

The Procedure of the Study

The data collection process is conducted in October and November 2021. This study uses a mixed-method approach as it works with words and meaning and data collection and numbers. The data collection starts with UHD in early October, and the first part of the data (the hand written copy of texts) is collected over the period of two days in a row. UHD students from Semantics class are asked to participate voluntarily. Then, the same group of students are asked to write about the same topic later on but type it in a word file on a computer (using auto-correction) instead and email it to the researchers. After two weeks, the researchers receive all the online versions by email. Following that, in one of the writing classes at UoS, the instructor asks the students to write two paragraphs, one in handwriting and the other in auto-correction, over three weeks. Finally, the researchers collect the final part of the data from KUST. The data is collected from writing I class, where students are required to compose two paragraphs, and the entire process needs about two weeks. After two months, the data analysis procedure begins. First, all of the handwriting sheets are scanned to locate all of the mistakes, then the soft copy, in which auto-correction is used, is read, and all of the mistakes are highlighted, and finally, both paragraphs are compared. The same procedure is applied for all the data collected from all of the participating universities. It is clear that both mixed methods quantitative and qualitative methods are used to analyze data in this study; first, the researchers gather the number of mistakes made by students in grammar, vocabulary, spelling, and punctuation; then, analyze the level of students' writing skills.

Results and Data Analysis
University of Human Development

Table 1. *Results of UHD: Student Mistakes*

Category	Number of mistakes in the Handwritten paragraph	Number of mistakes in the Auto-corrected/typed-in paragraph
Grammar	105	209
vocabulary	23	32
spelling	182	47
punctuation	129	241
Total number of mistakes	439	529

Ten students from the University of Human Development have participated in the research. They made 439 errors in the handwritten texts and 529 errors in the auto-corrected texts. Furthermore, they made 105 grammar errors in the handwritten texts but 209 grammatical mistakes in the auto-corrected texts. While having a strong vocabulary is an essential part of the writing process, UHD students made 23 vocabulary errors in handwritten but 32 in auto-corrected texts. In contrast to the previous two categories, students made more spelling mistakes in the handwritten texts than in the auto-corrected texts, with 182 spelling errors compared to 47 in the typed text. Punctuation is complex in writing because students often struggle to identify correct

positions; 129 punctuation errors were placed in the handwritten texts and 241 in the auto-corrected texts. In summary, students made more grammar, vocabulary and punctuation mistakes in the auto-corrected texts and more spelling mistakes in the handwritten texts.

Example from (UHD)

Auto-correction   handwriting
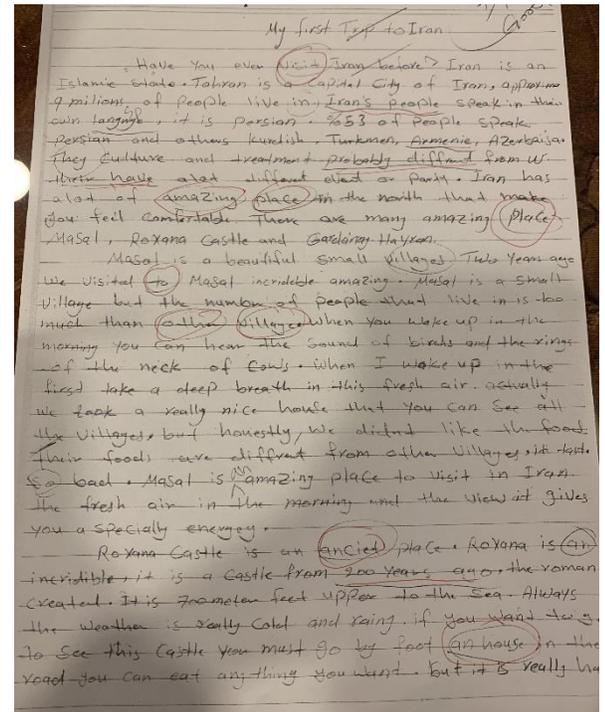
These two images are an example of UHD imaging. The first image is auto-corrected, whereas the second is handwritten. In the auto-corrected one, the student has numerous problems in grammar structure but few grammatical mistakes in handwriting, such as misusing articles; the student's grammar level is relatively poor. Furthermore, the level of vocabulary is similar in both situations. The main issue is spelling; in this case, it is apparent that auto-correction impacts spelling ability; the students made several spelling mistakes in handwriting, such as (anciet, restaurnt, etc.), but there are also spelling errors in the auto-corrected texts. Punctuation is the last one; This student made more punctuation mistakes in the auto-corrected text than in handwriting; for example, the position of the coma is incorrect in some instances, therefore based on this and other examples, auto-correction has a more significant impact on spelling than different writing abilities.

University of Sulaimaneyah

Table 2. Results of UoS: student mistakes

Category	Number of mistakes in the Handwritten paragraph	Number of mistakes in the Auto-corrected/typed-in paragraph

Grammar	48	29
Vocabulary	7	6
Spelling	124	15
Punctuation	66	26
Total number of mistakes	245	76

Ten students from UoS have participated in the research, and a total of 245 mistakes were identified in their handwritten texts and 76 in their auto-corrected texts. Students made 48 grammar mistakes on the handwritten texts and 29 in the auto-corrected texts. Surprisingly, only seven mistakes in choosing inappropriate vocabulary were found in the handwritten texts and six in the auto-corrected texts. The handwritten texts also featured 124 spelling errors compared to the 15 errors found in the auto-corrected texts. Finally, students made 66 punctuation errors in the handwritten texts but only 26 in the auto-corrected versions. In summary, students made more grammar, vocabulary, spelling and punctuation mistakes in the handwritten texts than in the auto-corrected texts, with a huge difference in the case of spelling mistakes.

Example: from (UoS)
Auto-correction   Handwriting
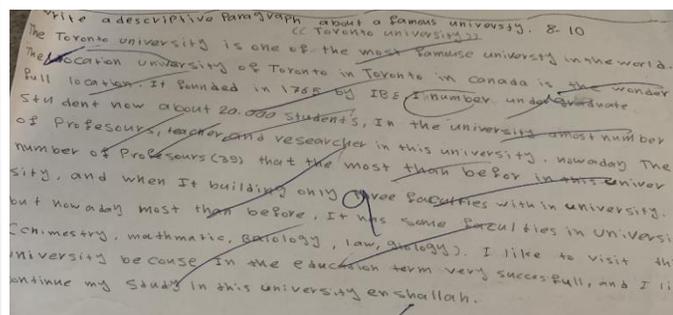
The above given example of data is from UoS, one piece of writing in auto-correction mode and the other in handwriting. This student experienced more grammatical mistakes in writing than in auto-corrected work, and most students at this university struggle with grammar structure when writing paragraphs on paper (data shows). It is difficult to assign a vocabulary level through writing paragraphs, yet auto-correction does not affect vocabulary here at this university through those examples. Students at UoS, for example, have a lot of problems with spelling (importan, noway, locaton, etc.); therefore, one of the reasons for poor spelling at this university may be the frequent use of auto-correction. In this case, the student's handwriting contains more punctuation difficulties than the auto-corrected version because auto-correction corrects punctuation errors for the students. Overall, auto-correction impacts the level of spelling and punctuation at this university.

Komar University of Science and Technology

Table 3. *Results of KUST: student mistakes*

Category	Number of mistakes in the Handwritten paragraph	Number of mistakes in the Auto-corrected/typed-in paragraph
Grammar	48	73
Vocabulary	8	19
Spelling	124	3
Punctuation	88	64
Total number of mistakes	268	159

Ten students from Komar University have participated in the study and they made 268 writing errors in their handwritten texts and 159 in their auto-corrected readers. It is clear that most students are not engaging in incorrect grammar use; 48 grammar mistakes were made in the handwritten texts and 73 in the auto-corrected versions. Students also struggled to find appropriate vocabulary; 8 errors were made on the handwritten texts compared to 19 in the auto-corrected versions. Students also made many spelling errors while handwriting; 124 spelling mistakes on paper and three spelling mistakes using auto-correction. There were 88 punctuation errors in the handwritten texts and 64 in the auto-corrected texts. Grammar and vocabulary mistakes were more common in the auto-corrected texts, and spelling and punctuation were more frequent in the handwritten version. Again, there was a sizable difference in the number of spelling errors between the two formats.
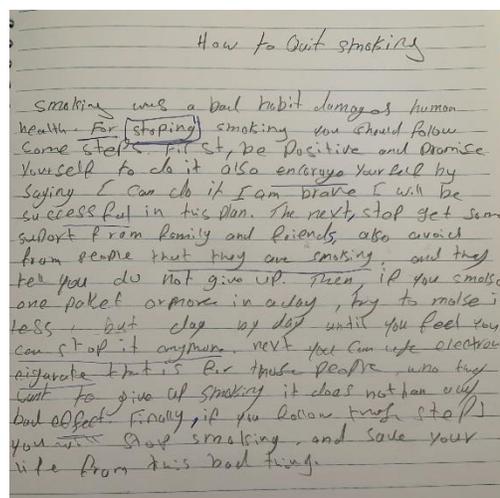
Example: from (KUST)

Auto-correction   Handwritten

How to Quit Smoking

Smoking is a bad habit damages human's health. For stopping smoking you should follow some steps. First, be positive and promise yourself to do it, also encourage yourself by saying I can do it I am brave I will be successful in this plan. The next step, get some support from your family and friend, also avoid from people that they are smoking, and they tell you do not give up. Then, if you smoke one packet or more in a day, try to make it less, but day by day until you feel that you can stop it anymore. Next, you can use Electronic Cigarette that is for those people, who they want give up smoking, it does not has any bad effect. Finally, if you follow these steps you will stop smoking, and save your life from this bad thing.

In this sample from KUST, the student made more grammatical errors in handwriting than the auto-corrected one, implying that auto-correction assists students correct grammatical errors. There is no degree to measure vocabularies level, yet in auto-correction, students use weak words, but they use stronger vocabularies in handwriting. The main issue here is that students made many spelling mistakes, such as (stoping, suport, cigarate, encarage,..etc.). Yet, suppose you return to quantitative analysis ultimately. In that case, there are only three mistakes in the auto-corrected one, which means that students at this university use auto-correction a lot, and it negatively impacts their spelling ability. Students committed punctuation errors in both situations, although

handwriting has more punctuation errors. For example, the student did not put coma after (first, and then), which is required in this example. In this university, auto-correction affects spelling and punctuation; otherwise, auto-correction helps students develop their grammar abilities.

Discussion of the Findings

In general, the research findings provide a relatively clear picture of how auto-correction affects the writing skills of students at three different universities in Sulaimaneyah City, with auto-correction appearing to have a negative impact on the writing skills of students from two of the universities. Nonetheless, their handwriting and auto-correction errors were comparable in the case of students from one university, suggesting that auto-correction did not affect their writing skills.

Discussion of the Grammar Findings

According to the data, students face more grammar problems while writing using auto-correction; for example, students from UHD produced 105 grammar errors in the handwritten texts but that number doubled to 209 when using auto-correction. The fact that grammar mistakes are made in both formats, suggests that the students have grammar issues in general. Students profited from using writing software because it improved their organizational skills and made their writings more ordered and more straightforward to read than those written by hand. As a result of word processors' ability to fix spelling and provide suggestions for grammar faults, these students generated compositions with fewer grammar and spelling errors, which are usually rectified automatically by the program (Alisa Sadiku and Ardian Krasniqi p8 2018).

Discussion of Vocabulary Findings

The data shows that students made vocabulary mistakes in both formats in the vocabulary section. However, errors were more common in the auto-corrected texts because auto-correction programs always suggest more academic words, which many students find challenging to use. For example, students from Komar University struggled to identify appropriate vocabulary; 8 errors are made in the handwritten texts but 19 in the auto-corrected versions. Students show a preference for using computers in writing; they appear to be more motivated and excited. When students write on computers, the process of composition becomes a social interaction as they share their work with their friends, enhancing their collaborative and cooperative behaviour and making this a fun and exciting task. They also learn to employ new vocabulary (Alisa Sadiku and Ardian Krasniqi p9 2018).

Discussion of the Spelling Findings

According to the study, students' memories suffer due to the use of auto-correction, with most of the students making spelling mistakes in the handwritten texts. However, a careful analysis of the students' spelling mistakes leads us to conclude that the students might know the correct spelling of the words they have misspelt. Spelling is an essential part of writing skills. This section clearly shows that auto-correction has a significant impact on writing abilities; for example, UHD students made more spelling mistakes in their written texts than in the auto-corrected versions, 182 compared to 47, respectively. Students of UoS made 124 spelling errors in the handwritten texts and 15 in the auto-corrected versions, while KUST students made 124 and 3. The results clearly show that auto-correction affects the spelling section more than the other sections.

Netspeak's informal language register has also aided in developing poor written English. Because of the screen size limitations, many Web pages' text is significantly shorter than printed language, with short phrases and paragraphs for ease of reading (Amani M. Alhusban p4 2016).

Discussion of the Punctuation Findings

Punctuation is a consistent problem in students' writing tasks; the data for UHD students showed 129 punctuation errors in the handwritten texts and 241 in the auto-corrected versions. In contrast, students of UoS made 66 punctuation errors in their handwritten texts but only 26 in the auto-corrected versions. Data from KUST shows 88 punctuation errors on paper and 64 in the auto-corrected versions. So the research shows that in one university, students make more punctuation mistakes using auto-correction. Nevertheless, more punctuation mistakes are made in the handwritten texts in the other two institutions. Email and short messaging services (SMS) are employed for quick communication, and the occasional error may sometimes appear. Students who write without capitalization or punctuation for the sake of brevity and convenience without considering scholastic ramifications risk being labelled as slackers (Amani M. Alhusban p 4 2016).
Study Limitations and Suggestions for Future Research

This study focuses on a limited group of participants from three universities in Sulaymaniah City, with only thirty people being able to participate in this study. However, while this study does make a valuable contribution to what is known about the impact of auto-correction on students' writing skills, one possible restriction may be that the sample of participants is limited to undergraduate students. At the same time, the majority of this type of auto-correction appears to have a negative impact on students' writing abilities during their university years. Therefore, future research could examine students' skills from schools and colleges and students at different points of their academic careers (for example, high-school students) to see if auto-correction has had impacts before their entry into higher education.

Finally, future studies should include a random sample of participants from different higher education institutions in Kurdistan to provide more comprehensive results.

Conclusion

Modern technology tools are unmistakably changing the contemporary writing process and writing skills. Nowadays, students are "altering the nature of the English language" by depending on technology to 'correct' all of their writing mistakes (Bromley, 2010, p. 103). Fortunately, auto-correction mainly affects students spelling. However, the data in this study suggests that auto-correction has a negative influence on writing skills in some cases. Nonetheless, it has no effect or beneficial impact on students' writing in other instances, such as sometimes students being taught grammatical rules from auto-correction.

About the authors

Kozhin Omer Ismael is a coordinator and full-time assistant lecturer at the University of Sulaimani/College of Basic Education/Department of English and a part time lecturer at Komar University of Science and Technology. She received her MA in English Language and Linguistics from the University of Birmingham/UK in 2015. Her teaching and research areas of interest are

Discourse Analysis, Cognitive Studies of Language and Applied Linguistics. https://orcid.org/0000-0002-8137-4033

Kochar Ali Saeed is a coordinator and full-time assistant lecturer at Komar University of Science and Technology. He holds a master's degree in English language teaching. He has about 3 years of teaching experience. He has taught different English subjects, such as Academic Writing, Reading Comprehension, Grammar, Semantics, and pragmatics. https://orcid.org/0000-0001-6313-2041

Airin Shwan Ibrahim has master's degree in English language teaching. She has about 3 years of teaching experience. She has taught different English subjects, such as English for specific purposes in various departments, Comprehension, Grammar, Reading, and conversation. https://orcid.org/0000-0002-4093-0056

Diya Shawkat Fatah is a graduate of English department of Komar University of Science and Technology in Sulaimani city, Iraq. https://orcid.org/0000-0002-1125-7667

References

Abdelrahman, O. N. M. B. (2013). The impact of using the word processor to develop EFL learners' writing skill at Al-Imam Mohammad Ibin Saud Islamic University. IUG Journal of Humanities Research, 21(2), 1-26.

AbuSeileek, A. (2006). The use of word processor for teaching writing to EFL learners in King Saud University. *Journal of King Saud University, 19*(2), 1–15

Akerman, P. T., Dykman, R. A., & Gardner, M. Y. (1990). Counting rate, naming rate, phonological sensitivity, and memory span: Major factors in dyslexia. *Journal of Learning Disabilities, 5,* 325–327.

Alhusban, A. (2016). The impact of modern technological tools on students writing skills in English as a second language. US-China Education Review, 6(7), 438-443.Allan, D. (2004). Oxford Placement Test. Oxford: Oxford University Press.

Ansarimoghaddam, S. & Tan, B. H. (2013). Co-constructing an Essay: Collaborative Writing in Class and on Wiki. 3L: Language Linguistics Literature Southeast Asian Journal of English Language Studies. 19(1), 35-50.

Bachman, L. (1991). Fundamental Considerations in Language Testing. Oxford: Oxford University Press.

Bahr, C. N. & Nelson, (1996). The effects of text-based and graphics-based software tools on planning and organizing of stories. Journal of Learning Disabilities.

Baker E. & Kinzer, C.K. (1998). Effects of technology on process writing: Are they all good? National Reading Conference Yearbook.

Baron, D. (1999). From pencils to pixels: The stages of literacy technologies. In G. Hawisher & C. Selfe (Eds.), Passion pedagogies and 21-century technologies (pp. 15-33). Logan, UT: Utah State University Press.

Beck, N. & Fetherston, T. (2003): The effects of incorporating a word processor into a year three writing program. Information Technology in Childhood Education Annual, V.1, P. 139-161.

Benwell, T (2018). What is Writing. English Club. Retrieved from
    https://www.englishclub.com/writing/what.htm

Bhandari, P. (2020). What is Qualitative Research? Methods & Examples. Retrieved from
    https://www.scribbr.com/methodology/qualitative-research/

Bromley, K. (2010). Technology and writing. In M. McKenna, L. D. Labbo, R. D. Kieffer,
    & D. Reinking (Eds.), International handbook of literacy and technology, 2, 349-
    355.

Bromley, K. (2010). The future of writing. In M. Foote, F. Falk-Ross, S. Szabo, & M. B.
    Sampson (Eds.), College reading association 29th yearbook. Navigating the literacy
    waters:

Chapelle, C. A., & Douglas, D. (2006). Assessing Language through Computer
    Technology. Cambridge: Cambridge University Press.

Chapelle, C., Grabe, W., & Berns, M. S. (1997). Communicative language proficiency:
    Definition and implications for TOEFL 2000. Princeton, NJ: Educational Testing
    Service..

Collier, R. & Werier, C. (1995). When Computer Writers Compose by Hand. Computers
    and Composition. 12, 47-59.

Crystal, D. (2008). Txtng: The gr8 db8. Oxford: Oxford University Press.

Dansieh, S. A. (2011). SMS texting and its potential impacts on students' written communication
    skills. *International Journal of English Linguistics*, *1*(2), 222-229.

Ellis, R. (2003). Task-based Language Learning and Teaching. Oxford: Oxford University Press.

Grabe, W. & Kaplan, R. B. (1996). Theory and Practice of Writing: An Applied Linguistic
    Perspective. Longman: London.

Haralson, J., & Ross, K. (2007). Does text messaging hurt student writing skills. *American
    Teacher*, *92*(3), 4-20

Hoomanfard, M. H., & Meshkat, M. (2015). Writing on a Computer and Using Paper and Pencil:
    Is there any Difference in the Internal Cognitive Processes?. GEMA Online Journal of
    Language Studies, 15(2), 17-32

Hoomanfard, M. H., & Meshkat, M. (2015). Writing on a Computer and Using Paper and Pencil:
    Is there any Difference in the Internal Cognitive Processes?. *GEMA Online Journal of
    Language Studies*, *15*(2).

InternationalJournal of Advanced Trends in Computer Science and Engineering, 1(1). Retrieved
    from http://www.warse.ijatcse.current.

Madden, D., & Laurence, D. (1994). An examination of college writing skills: Have they
    deteriorated? Education Resources Information Center. Retrieved May 2, 2015.

Nævdal, F. (2007). Home-PC usage and achievement in English. *Computers & Education*, *49*(4),
    1112-1121.

Olson, D. R., & Oatley, K. (2014). The quotation theory of writing. *Written
    Communication*, *31*(1), 4-26.

Omar, A., & Miah, M. (2012). Impact of technology on teens' written language. *International
    Journal of Advanced Trends in Computer Science and Engineering*, *1*(1).

Research, praxis & advocacy (pp. 2-10). Commerce, T.X.: Texas A & M University.

Sadiku, A., & Krasniqi, A. (2018). Computers' impact on students' writing skills. UBT
    International Conference. 121.

Sorrentino, J. (2008). Is spell check creating a generation of dummies? Education.com. N.p., January 11 2008. Web. October 08 2013.

Swartout, S. K. (2013). The Impact of Computer Applications on the Development of Students' Literacy Skills. Alhusban, A. (2016). The impact of modern technological tools on students writing skills in English as a second language. *US-China Education Review*, *6*(7), 438-443.