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MEDIATING MULTILINGUALISM IN ENGLISH LANGUAGE CLASSROOM: PROSPECTS AND CHALLENGES

Automated Writing Evaluation: Overcoming Mechanical Engineering Vocational Education Students' Difficulties in Academic Writing

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Abstract

The need for automated writing evaluation tools leads students to overcome academic writing difficulties. Nevertheless, some research proved that automated writing evaluation only focused on students' difficulties in academic writing, instead of how to overcome difficulties using the tools. As a result, the purpose of this research was to analyze how an automated writing evaluation tool may employ students' difficulties in Mechanical Engineering Vocational Education of Universitas Negeri Jakarta who struggle with academic writing. The research used a qualitative survey, and the design of the study was descriptive analysis. The data sources were students writing articles and 30 students of Mechanical Engineering Vocational Education in the second semester in the English class. The online questionnaire was used to gain the data, which was interpreted and analyzed descriptively. The questionnaire, which was split into PART A and B, consisted of 21 items that were delivered to 30 students. The findings found that difficulties exist. The highest difficulty was in the Grammatical aspect, followed by Word Classes, Word Errors, and Word Formatting. Even if automated writing evaluation helps students' difficulties, students are not advised to use it in the whole process of writing. It does not ensure to help 100% of the writing.

Keywords: automated writing evaluation; academic writing difficulties; grammatical aspect

Introduction

ICT tools have been a growing awareness that could provide numerous educational benefits (Alkamel & Chouthaiwale, 2018). Typically, pedagogy took priority over technology in the integration of ICT into the concept of teaching and learning because it involved using ICT to improve teaching and learning (Alkamel & Chouthaiwale, 2018). The primary emphasis of ICT infusion in pedagogy must be such that it tended to improve learning, inspire, and engage beginners, promote collaboration, facilitate inquiry and exploration, and establish a new learner-centered learning culture to be integrated (Rabah, 2015).

Integration of ICT into teacher education and teaching practices was a complex and challenging issue. In this regard, Tekin et al., (2020) claimed that simply equipping classrooms with

the necessary ICT equipment did not improve the quality of education or create more effective learning environments. Nonetheless, schools should reconsider their current teaching programs, practices, and resources given a more expansive philosophy and vision. Because technology relied on interdependent variables, it was not always simple to combine them properly. (Rabah, 2015). This study examined the interconnecting variables, namely variables associated with ICT integration in training, with a focus on three classes related to the ICT integration of pre-service teachers' teaching practices. These classes represented ICT integration in education, pre-service teachers' perceptions of ICT integration, and the perceived impact of pre-service teachers' perceptions on their ICT integration practices in training.

It enabled the transition from a reproductive version of teaching and learning to an independent, self-reliant learning model that encouraged initiative, creativity, and critical thinking through independent research (Tekin et al., 2020). In an authentic and active learning paradigm, students were expected to collect, select, analyze, organize, expand, transform, and share knowledge using ICT. With an interactive, experiential, and multimedia-based system, teachers were expected to develop a new flexible and open learning environment (Noori, 2020).

ICT should enable teachers and students to communicate and collaborate without restrictions, empower students to become self-reliant and permit teachers to incorporate the entire world into classroom activities. It was crucial to acknowledge the roles of ICT in promoting educational changes (Rabah, 2015). A simple principle was that the use of ICT modified the distribution and property of information resources within the domain of instruction and learning, thereby modifying the relationships between instructional participants. When designing innovative teaching and learning environment utilizing ICT, or in this case of research, with automated writing evaluation (AWE), the teacher must keep learning at the center of all activities, pedagogy must be at the center, and pedagogy-technology integration must be the primary focus (Alkamel & Chouthaiwale, 2018). The use of ICT tools could be beneficial, with automated writing evaluation as the part of ICT tool, which could help students in learning the process of writing, and teachers in correcting students' writing products (Wang & Li, 2019).

One of the ICT tools that been used for helping students in writing academic text was automated writing evaluation (Nur Faradhibah et al., 2018). Pedagogy took priority over technology in the integration of ICT into the concept of teaching and learning because it involved using ICT to improve teaching and learning (Alkamel & Chouthaiwale, 2018). The primary emphasis of ICT infusion in pedagogy must be such that it tended to improve learning, inspire, and engage beginners, promote collaboration, facilitate inquiry and exploration, and establish a new learner-centered learning culture (Rabah, 2015). According to (Siahaan, 2020) technology facilitated new teaching pedagogies and learning approaches that encourage student participation. Rabah (2015) added that technology was an influential and adaptable learning tool that was required and wanted to face globalization

challenges, develop our country's economic status, and stimulate and assist students to learn better. Reviewing to Hockly (2019) several previous studies had demonstrated that automated writing evaluation could be an effective learning tool for academic writing, and employed the developed system to evaluate writings.

In addition, automated writing evaluation employed an artificial intelligence developed through computational linguistics to evaluate and score the writing submitted to the program (Wilson & Czik, 2016). Automated writing evaluation analyzed the writing on lexical, syntactic, discourse, and grammar levels and provided diagnostic feedback and correction to preview the writing evaluation result generated by the system (Nova, 2018). It also saved time when evaluating and assessing writings (Roscoe et al., 2017).

However, little information was known about how to optimize automated writing evaluation to assist students in mechanical engineering vocational education overcome academic writing difficulties (Wang & Li, 2019). There were numerous reasons why it was crucial to investigate this problem. Automated writing evaluation facilitated the teaching and learning of writing by allowing for a range of interactions between technology, students, teachers, and peers. (Wilson & Roscoe, 2020). For instance, automated writing evaluation included students' direct use of the system to plan, built, receive automated scores and feedback, revised their work, and enhanced their writing (Li et al., 2015).

It has previously been observed that automated writing evaluation acclaimed help students' difficulties in writing. First, according to O'Neill & Russell (2019), the use of automated writing evaluation tools believed to be useful assistance in writing. Besides that, the perceptions from the research accepted the feedback which came from them improved the grade of the assignment of the students.

Second, automated writing evaluation allowed learner-teacher interactions by including features that allow students to send messages to their teacher requesting assistance. Teachers were allowed to provide supplemental feedback through in-text and summary comments within the automated writing evaluation tools. (Wilson & Czik, 2016).

Third, some automated writing evaluations facilitated peer evaluation, thus also enabling peer interactions Wilson & Roscoe (2020). These interactions allowed teachers to implement various evidence-based writing instruction practices, including adult-, peer-, and technology-based feedback Wilson & Roscoe (2020), in addition to formative assessment practices related to diagnostic evaluation and progress monitoring (Graham, Hebert, & Harris, 2015) as cited as Wilson & Roscoe (2020).

Fourth, based on the use of automated writing evaluation in academic writing, the use of automated writing evaluation in writing activities was highly needed. Numerous academic goals requiring writing skills, including reports, assignments, exercises, and theses, must be acknowledged

(Ariyanti & Fitriana, 2017). However, learning to write, according to Riswanto (2021) was not as natural as learning to speak. Some speakers were able to get away with sparse content by using fluent speech. However, the problem in writing was more complicated than it was in speaking. It had been reported that students with writing difficulties struggle not only with spelling and letter formation but also with "generating ideas" for writing, which could lead to negative thoughts about the actual writing.

Fifth, related to students' difficulties in writing, some researchers found students' difficulties in writing. One of them was Sulistyaningrum & Avianka (2021) that the vast majority of students believed academic writing to be extremely challenging in terms of grammar, vocabulary, and expressions in that order. Ariyanti & Fitriana (2017) added three types of major problems encountered by students: grammatical, punctuation, and spelling issues. According to the findings, there were several factors that contribute to students' weaknesses in essay writing based on a record of their perspectives. Like all learning difficulties, writing difficulties could have a devastating effect on a student's education (Branch et al., 2017). According to Rahmatunisa (2014), writing skill was complex and occasionally difficult to teach. As students advance, they were increasingly expected to demonstrate their understanding of a variety of topics through writing (Fairbairn & Dunlea, 2017). If a student did not develop certain fundamental skills, they may not be able to write with the necessary speed and fluency to thrive as the demands increase (Nabeel Subhi & Subakir Mohd Yasin, 2015). The writing system itself impeded a student's ability to learn when the person had writing difficulties, students who faced such significant challenges struggle to maintain their motivation (Rahmatunisa, 2014). The essential aspect that made writing difficult was using the language element or skill in writing such as punctuation, spelling, grammar, vocabulary, and such. According to Branch et al., (2017), writing was frequently complicated by the process of putting words on paper in the same form as an outline organized with appropriate words and vocabulary the major ideas organized in some situations on the correction of mechanical and grammatical errors, especially the difficulties happened among the students.

Because students were taught to transform the language they learned into written expressions of their emotions and evaluations, writing skills were an essential component of language learning. (Rahmatunisa, 2014). The system of writing involved the accumulation of writing materials and the organization of ideas. (Roscoe et al., 2017). Lacking the ability to organize and plan the structure of a writing article, as well as the inability to collect relevant information and experience from long-term memory to incorporate it into their writing, maybe the most significant problem encountered by beginners. (Dolean, 2014). In addition, (Diyana Binti Maznun et al., 2017) emphasized the significance of assisting students with accumulating writing materials (supply), creating writing plans, re-modelling their ideas from working memory into textual phrases, and then describing their experiences in textual phrases throughout the writing process. Several strategies for writing instruction

were proposed. (Li et al., 2015). In the presentational mode, for instance, teachers assigned writing topics and manual tools to begin the writing phase; in the environmental mode, teachers provided students with related writing materials and encourage them to present their writing through discussion. In the linear model, teachers prepared learning materials for students, who were then required to complete the writing within the time given after reading the learning materials (Education, 2016).

In the meantime, the questioning of students would be affected by environmental, internal, and operational factors during the writing process. (Xiao & Chen, 2015). The internal elements referred to how students obtain associated substances from the brain and reproduce the photo's context as a source of writing inspiration. (Xiao & Chen, 2015). The environmental elements were those external factors that influence beginners and consist of teachers' rewards and students' or teachers' connections. The operational elements were the procedure from prewriting, planning, writing, and reviewing for which students must prepare the language and sentences to produce a complete piece of writing.

Galbraith & Baaijen (2018) suggested that teachers provide students with writing instruction by assisting them to remember the enjoyment associated with writing subjects, then by creating writing plans to achieve the writing goals accordingly, and finally by having students compose their thoughts in textual form. Recently, a revised model consisting of the assignment environment and the character was presented (Wilson & Czik, 2016). The newly revised edition emphasised the role of working memory in writing in addition to the characteristics of the text interpretation process, the system of writing transcription, and the motivation of writers have also been discussed (Xiao & Chen, 2015).

In the meantime, (Dwihandini et al., 2013) found that teachers must assess students' writing cognition capacity and provide beginners with appropriate learning scaffolding to transform inner questioning into unique phrases, and provide students with organized writing procedural knowledge including sample rhetoric and syntax as references to complete the writing exercises. Xiao & Chen (2015) believed that teachers should be provided with a variety of writing instructions to improve students' writing. The ability to transform oral language into textual writing and to provide an explanation for abstract concepts using subtle words and sentences were two of the most difficult obstacles for beginner writers to overcome. These obstacles and problems had made many researchers interested to conduct some research related with those things.

Extensive research was also conducted to solve many of the problems encountered by EFL (English as Foreign Language) students when writing essays. Previous Research had found the same problems in academic writing, which was in the grammar aspect (Harris et al., 2014). In addition to Rahmatunisa (2014) also discovered that EFL college students encounter linguistic difficulties in their written work. Rahmatunisa (2014) divided the obstacles that make writing difficult into three categories. The first difficulty was Linguistic Difficulty. Elements of language such as grammar,

vocabulary, language usage, and sentence choice should be strictly monitored. The second was Psychology Difficulty, which focused more on the writer's difficulty due to the lack of direct reader interaction and remarks when they were writing. This difficulty focused primarily on the inability to expand written material or compositional content. The third difficulty was cognitive. Formal preparation, including correct spelling, punctuation, capitalization, and paragraphing, was required for writing.In that case, students needed tools to employ them facing their difficulties in writing activities such as using automated writing evaluation and machine translator. One of the most popular automated writing evaluation tools that have been used was Grammarly (O'Neill & Russell, 2019).

Grammarly was selected due to its ability to reconcile contradictory theories concerning written corrective feedback. Much has been written concerning the relative advantages of direct and indirect feedback. Proponents of indirect feedback (Nur Faradhibah et al., 2018) argued that the difficulties should only be highlighted for the student to independently review and correct, whereas proponents of direct feedback. Nova (2018) argued that explicit corrections must be provided by the teacher. Grammarly reconciled these distinctive theoretical approaches by allowing teachers to employ both. A further reason for selecting Grammarly was the lack of research on its performance in academic contexts. Grammarly improved the written accuracy of undergraduate research students, according to a study by O'Neill & Russell (2019). Grammarly performed better than traditional teacher intervention in terms of long-term retention of passive voice rules, according to (Zhang, 2013).

However, numerous researchers had been conducted studies on the use of automated writing evaluation that have primarily focused on English, writing, and reading rather than writing difficulties, it could be seen one of them from the research of Paskal et al. (2015). Only limited research appeared interested in employing automated writing evaluation to assist mechanical engineering vocational education students with academic writing difficulties, for example from the previous research by Wang & Li (2019). Consequently, this gap prompted the researcher to conduct the present study.

In brief, this research aimed to explore the employment of automated writing evaluation tools in overcoming mechanical engineering vocational education students' difficulties in academic writing. Thus, the research question for this research was: "*How do the automated writing evaluation tools overcome students' difficulties in academic writing?*"

Research Methodology

This study employed qualitative descriptive research. From the adjustment of Rahmatunisa (2014) and O'Neill & Russell (2019), the researcher made the indicator of the questions in the questionnaire. The study's participants are 30 students of Mechanical Engineering Vocational Education of Universitas Negeri Jakarta enrolled in English academic writing class.

The questionnaires are divided into two parts. Questionnaire part 1 was to know the tools that have been used by the students. Questionnaire part 2 was to know the employment of automated

writing evaluation tools in mechanical engineering vocational education students. Questionnaires are used as the instrument to gather data about the employment of automated writing evaluation to overcome students' difficulties in academic writing. The questionnaire consisted of 21 questions. The questionnaire was distributed to 30 students and obtained the data to answer the research question. This questionnaire used Bahasa Indonesia as the language and was modified by the researcher for PART A adapted from the other relevant studies by Rahmatunisa (2014), which included grammar, punctuation, spelling issues, word formation, word category, error spelling, and the use of articles. Meanwhile, the design of questionnaire items (PART B) from other relevant studies by O'Neill & Russell (2019). Both parts of the questionnaire were modified by the researcher with some adjustments in the questions of the questionnaire. From the adjustment of Rahmatunisa (2014) and O'Neill & Russell (2019), the researcher made the indicator of the questions in the questionnaire.

The data sources were taken from 30 students of Mechanical Engineering Vocational Education of Universitas Negeri Jakarta who were enrolled in English academic class. The students were asked to complete the questionnaire part 1 from Rahmatunisa (2014) first, which consisted of grammar, punctuation, spelling issues, word formation, word category, error spelling, and the use of articles. Then, the students were asked to complete the questionnaire part 2 from O'Neill & Russell (2019) to know the employment of automated writing evaluation tools. In this study, the Likert Scale Instrument was used to calculate the results of the questionnaire. The type of automated writing evaluation tool used was Grammarly.

Results and Discussion

There were 30 writing products of Mechanical Engineering Vocational Education students of Universitas Negeri Jakarta which had been analyzed by the researcher. The product included their draft of the essay or mini research articles that they made for their assignment.

In the upcoming section, here was the finding of the research question that had been mentioned previously:

Table 1. Descriptive Analysis on The Employment of Automated Writing Evaluation to Overcome Students' Academic Writing Difficulties

Students' Difficulties	Percentage	Predicate
Grammatical Structure	76,67%	Very Good
Word Classes	52,21%	Good
Word Errors	43%	Fair
Word Formatting	42,88%	Fair
Total Percentage	53,69%	Good

From the table above, automated writing evaluation's performance in overcoming students' difficulties could be seen. In a total of 53,69% and the predicate was "Good", it meant Automated Writing Evaluation could overcome the difficulties well. The highest overcoming by the tools was

Grammatical Structure with a percentage of 76,67% and a "Very Good" predicate. The second was Word Classes with a percentage of 52,21% and a "Good" predicate. The third was Word Errors with a percentage of 43% and a "Fair" predicate. The last was Word Formatting with a percentage of 42,88% and a "Fair" predicate.

From the questionnaire, there were 7 questions related to the roles of automated writing evaluation to employ their difficulties in writing academically. And 30 students who participated in filling out the questionnaire. From the data, it could be concluded that from 21 students who were being surveyed, most of them agreed that automated writing evaluation helped them in solving their difficulties.

The percentage number of the difficulties surveyed was 70% agreed on the grammatical aspect, 63,30% on correcting tenses, 70% on choosing correct conjunction, 76,70% on choosing correct vocabulary, 70% on giving proper feedback, 77% on identifying errors, and 80% on improving their academic text. It meant that automated writing evaluations were agreed upon by the students to help them in writing academic text. This finding was confirmed by Li et al. (2015).

From the data, it can be discussed that from Mechanical Engineering Vocational Education students of Universitas Negeri Jakarta which had already been collected and analyzed by the researcher to discover their academic writing difficulties and the roles of the automated writing evaluation tools in dealing with those difficulties. Firstly, it highlighted the students' experience of their difficulties in academic writing. Secondly, it presented the roles of automated writing evaluation tool. Through this chapter, the evidence presented from students' writing products and supported by the questionnaire that previously was distributed.

From the current research, it was discovered that the most highly academic writing difficulty encountered by 30 students of Mechanical Engineering Vocational Education was grammatical structure. This finding was confirmed by Ariyanti & Fitriana (2017) and Roscoe et al., (2017). It could be seen from their writing products that previously had been analyzed. To make an example, from their products, it could be seen that students were confused in choosing the right tenses for their writing. Whether or not they were going to choose simple present tense or past tense. As a result, there were many grammar errors in their writing products.

The findings showed that the automated writing evaluation tool was good to overcome students' difficulties in academic writing to assist them in choosing grammar. It was confirmed by the findings of Li et al., (2015). Although they favor using other tools, such as machine translation. It was confirmed by Sulistyaningrum & Avianka's (2021) research found that many students used and considered machine translation to overcome students difficulties in finding proper word classes. To sum up, using automated writing evaluation to overcome students' difficulties in academic writing was categorized as "Good." It could be seen from the overall percentage of 53,69% in the range of 50% ≤ x75% with the biggest employment from the grammatical structure with 76,67%. This had a meaning

that automated writing evaluation could be a helpful tool to overcome students' difficulties in academic writing.

From the findings, the researcher found the limitations that the automated writing evaluation could only detect and fix in a general way. Not all tools could manage problems and difficulties in academics perfectly. Some aspects that needed to manage the problems, these were reading and the teacher's role. Reading was needed to explore again the difficulties found by the tools. In the same thing, the teacher's role was needed to correct the difficulties found by the tools. Even if automated writing evaluation could provide the best system for detecting the difficulties, this cannot be taken as a certainty result. Since academic writing needed the experience to evaluate the writing product, as well as the teacher's role.

Conclusion and Suggestion

In this research, the researcher found that the most difficulties encountered by students in Mechanical Engineering Vocational Education were grammatical structure. Followed by word classes, then word errors, and the last word formatting. According to this study, most of the students agreed that they used automated writing evaluation to overcome their academic writing difficulties. The findings showed that students today were skilful with technology. This also demonstrated that automated writing evaluation was believed to be beneficial for academic writers. The research revealed that the most automated writing evaluation tool that has been used was Grammarly. Based on the results of the research, there were some implications. Students thought that the complete task to write academic writing could be completed and finished relied only upon the tools, which in this context was automated writing evaluation. But the researcher viewed in the end, that there was a need for guidance by the lecturer to understand their difficulties because the tools only gave a general view to correct the mistake. But to understand the text, the role of the lecturer was highly needed too.

Based on the data that researchers have found, students viewed academic writing as a challenging activity to do. As a result, widespread reflection was needed since academic writing was something that could not be understood in a short time, especially by non-native students. It could be learned through practice by the students from their lecturers in universities. Then, it could be optimized by an automated writing evaluation tool.

There were only 30 students of Mechanical Engineering Vocational Education students in Universitas Negeri Jakarta who participated in this research which meant this research only studied a limited number of academic writing difficulties and could not be generalized to other contexts. To make better research, there needed to grow the number of participants to make a wide variety of the academic writing difficulties experienced by the students.

In conclusion, there were various difficulties in writing an academic text, and an automated writing evaluation tool was needed to overcome those difficulties. Although automated writing

evaluation was only detected and fixed the difficulties. It still needed the role of the teacher or lecturer to make students understand their writing product better. Not all tools could manage problems and difficulties in academics perfectly. Reading was also needed to explore again the difficulties found by the tools. Based on the current study, it was provided several recommendations based on the findings. Related to that, teachers or lecturers should help the students in the academic writing field. To start with, there should be serious treatment in teaching English academic writing. We could see in the findings that language has been the most challenging aspect for students in writing academic text. Concerning it, and to overcome the language barriers, teachers should advance their teaching system. Teachers were advised to select the writing examples carefully to do writing activities to provide an applicable reference for students. When dealing with grammar, teachers should pay attention to the grammatical structure like the tenses, word choices, and make the students understand to choose the proper structure or tenses for their academic writing. The automated writing evaluation was playing a significant role in this process. Teachers or Lecturers could advise them to identify alternative options on the grammatical structure or tenses through automated writing evaluation and related things for their academic writing. Roscoe et al. (2017) mentioned the automated writing evaluation role in their study.

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