Integrating ICT Learning Model and the Use of AI to Enhance Students' Writing Quality

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Abstract. ICT literacy is essential since digital tools are used almost in every aspect of life, especially in this era where people count on the tools to make them stay at home but still interconnected with people. These tools are various, yet not all students have used them to support their academic needs. This study is aimed at improving students' writing quality by integrating ICT learning model and the use of AI in the writing class. A learning model usually implemented for teaching ICT constructed by UNESCO is employed. It is also completed by the last step which is proofreading. The proofreading step is done by using the help of artificial intelligence. The method employed is Research and Development. The study is started by identifying instructional goals, conducting a goal analysis, identifying entry behavior characteristics, formulating performance objective, developing criteria-referenced test items, developing instructional strategy, developing and selecting instructional materials, designing and conducting formative evaluation, and doing revision. It is found that the learning model of ICT and the use of AI significantly help the students enhance their essay writing quality, which can be seen from the result of their writing score in the formative tests. It can be seen that students' writing skill is improved by the help of ICT learning model and the use of AI.

Keywords: ICT learning model, Essay Writing, Artificial Intelligence

1 Introduction

One of the main functions of writing pedagogy in an academic context is to facilitate students to be able to produce written works through the acquisition of contemporary practices in the domain of academic literacy [1], [2]. To improve the quality of writing produced by students, it is necessary to think of effective ways to teach them how to write well. This is very important because it has been proven that there is a very strong relationship between teaching methods in class and the quality of students' writing [3]. Some lecturers who teach writing in the observations of researchers, still provide writing theories in class to teach writing English essays instead of asking students to keep practicing writing.

Giving writing theory to students was not directly proportional to the expected results. Students still have difficulty getting ideas to put into writing. When they get ideas to be written as material, the writing they write is not critical, whereas in 21st century learning, students are required to be able to think critically and creatively, be able to collaborate, and communicate their work [1]. Writing well and critically is indeed not easy because writing is a high-level skill that can continue to develop through the interaction between student's skills and cognitive abilities, instructional contexts, and the demands of writing tasks [4]. Cognitive abilities,

instructional context, and writing assignments must be considered carefully by lecturers in higher education to help students have good and critical writing skills.

Good and critical writing skills are needed in order to form graduates who have high competitiveness. This is in accordance with the curriculum run in the English Language Education study program, at a university in West Java, Indonesia. The curriculum used is the Indonesian National Qualifications Framework (KKNI) curriculum, one of which focuses on the formation of highly competitive alumni [5]. In the KKNI curriculum, the formulation of a course syllabus is based on the competencies that must be achieved by students which are synchronized with the profiles of graduates from the study program [6]. In the English Language Education where researchers conducted the research, the alumni profiles include: 1) educators in English; 2) textbook author; 3) developer of assessment tools, 4) developer of English learning programs, 5) developer of English learning programs for children; 6) translators, 7) English researchers, and 8) English service providers.

When viewed from the alumni profile, writing skills are indispensable for the formation of highly competitive alumni. Therefore, writing is taught from the first semester to the sixth, which begins with a discussion of how to write correct sentences to the level of writing various types of essays and academic writing. In this study, researchers focused on essay writing lectures. The aim of the essay writing course is to gain knowledge, insight, and writing skills. However, the course objectives were not easy to achieve. In the lecture process, many problems were found. The problems include difficulty finding ideas, difficulty expressing ideas, language errors both in terms of word choice and grammar, and lack of student motivation. If these difficulties are not resolved immediately, they will result in ongoing obstacles in the lecture process [7]. Among the various types of writing taught, one type that is considered difficult and still has low learning outcomes is essay writing. Moreover, they have difficulty putting together ideas and presenting solid evidence to make a well-organized essay [2]. Even though essay writing is an important component in teaching and learning English as a second language (English as a second language / ESL), especially in universities [8] as well as what happens in general in Indonesia, English is a language first foreigner taught in school, not a second language. In particular, this condition also occurs in an English Language Education Study Program, in a university, which is used by the researchers to conduct the research.

From the results of preliminary observations made by researchers, there were three lecturers who taught essay writing courses in the fourth semester. The three lecturers teach in four different classes so that there are two classes taught by the same lecturer. In the classroom, two lecturers teach essay writing by providing theory about essay writing while another lecturer uses critical discourse analysis at the pre-writing stage. In addition to making classroom observations, the researchers also looked at documents which were student essays that were submitted to lecturers as final semester assignments.

Meanwhile, from the online questionnaire that the researchers distributed to the students who had taken writing courses in the fourth semester, they stated that writing essays was difficult due to their lack of insight, lack of vocabulary they had, and teaching techniques of lecturers in the classroom. The next question is why writing an essay is considered difficult. The majority of students answered because of their lack of insight. Figure 1 is a recapitulation of student answers regarding the reasons for writing essays that are considered difficult.
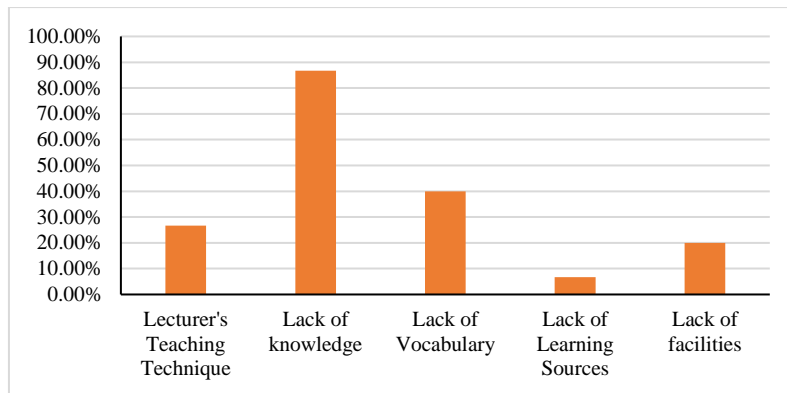
Fig. 1. Recapitulation of student responses regarding the reasons for the difficulty of writing argumentatively

Students consider that writing essays is difficult, especially because of their lack of insight, even though the ability to write essays is very important for students to master to articulate their ideas in an academically feasible pattern [9]. For this reason, it is necessary to improve the way lecturers teach in class because it could be that teaching methods are another factor that causes students to not succeed in mastering essay writing skills [7]. And indeed, students also confirm this (it can be seen in the graph) that the second cause is the lack of vocabulary and the third is the teaching methods of the lecturers.

Unfortunately, information about the methods used by lecturers as an approach to teaching writing is still limited. Until now, only a few systematic studies have discussed how lecturers teach writing [3]. One of them is a research conducted by [2] which explains the success of a lecturer in teaching argumentative essay writing in Thailand. The methods are as follows: (1) using various inputs and activities in the classroom to motivate students to become active learners, including working in pairs, group discussions, giving explanations, providing illustrations and implementing debate techniques; (2) analyzing sample texts and present or present their understanding in class; and (3) understanding their students' learning styles and provide them with what they need to develop their writing skills.

Another writing skill development strategy described by Sukmawan et. al. [10] which states that the use of literature to teach argumentative writing skills also shows significant results. Besides being able to provide writing ideas to students, literature can also improve their critical thinking skills. Another learning strategy is to use Mind Mapping. Mind Mapping is proven to improve students' ability to write argumentative essays that are coherent and coherent, as was done by Roslaini [11].

After studying the results of previous research regarding learning essay writing skills, in this study, the researcher wanted to develop an essay writing learning model that is adopted from the learning model of ICT which is integrated with the use of artificial intelligence. The steps of the ICT learning model is taught to be suitable to be applied in teaching essay writing. Though, the steps are added by one other step which is proofreading done by an AI. The ICT learning model is defined by UNESCO in A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2. The learning model of ICT is mentioned to develop students' digital literacy. Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technology for

employment, decent work and entrepreneurship. This includes various competencies referred to as computer literacy, ICT literacy, information literacy and media literacy [12].

In this research, the learning model of ICT defined by UNESCO is also integrated with the use of artificial intelligence. This is because the last step of ICT learning model is "to create" while in writing process approach, there are pre writing, writing, and post writing [13]. "To create" is only until the writing step. What to do in post writing can be various. One of them is proofreading. Proofreading is a beneficial thing to do but unfortunately, when it is done by peer, some revision might be less appropriate [14]. That is why the use of artificial intelligence is taught to be helpful. Hence, the use of artificial intelligence in education is quite dramatic [15].

There are many kinds of artificial intelligence that can be used in education. To teach writing, Grammarly, Essaybot, and SAS writing reviser are the examples. In this research, I would like to focus on the use of Grammarly. Therefore, after carrying out the steps offered by ICT learning model, the last step is checking the students' writing by copying it and pasting it onto Grammarly. From the artificial intelligence, it is expected that the writing of the students can have better quality. Table 1 is the activities of the students and the lecturer when the ICT learning model plus the use of artificial intelligence is applied:

Table 1. The ICT learning model plus

No	The Steps	Lecturer's Activities	Students' Activities
1	Accessing	Mentioning a topic and asking students to find related articles from the internet	Searching articles from the internet and read them
2	Understanding	Giving time for the students to understand what they read	Trying to understand what they read
3	Processing	Asking the students to process the information they have gained. Which information they will use and which one is not.	Processing the information and deciding which information to be used in their writing.
4	Integrating	Instructing the students to integrate their own idea with the information the have gained.	Integrating their own idea with the information they have already gained.
5	Communicating	Asking the students to communicate their ideas with their friends in a group.	Communicating their ideas with their friend to get new insight.
6	Creating	Instructing the students to write the idea they have gained from the information they gained.	Start writing their idea to be an essay.
7	Proofreading	Asking students to copy and paste their writing onto Grammarly	Copying and pasting their writing onto Grammarly.

2 Method

From the previous research and survey that has been conducted to the students, it can be inferred that the solution for the students' writing problems is a teaching technique that can guide them to gain the ideas to be written, help them perfect their grammar, and assist them correct wrong punctuation. After studying the literature, the writer made a plan for implementing the learning model of ICT and the use of artificial intelligence to make the quality of the students' writing better. However, in this research, the writer adds one additional step from the steps of UNESCO which is "proofreading". This step is conducted by using the help of artificial intelligence, in this case is Grammarly.

The research employs research and development method. The study is started by identifying instructional goals, conducting a goal analysis, identifying entry behavior characteristics, formulating performance objective, developing criteria-referenced test items, developing instructional strategy, developing and selecting instructional materials, designing and conducting formative evaluation, and doing revision

3 Results and Discussion

3.1 Results

This section will be written according to the steps of research and development method of Dick and Carey.

Identifying instructional goals

The research is started by seeing the potential owned by the students. They have good ICT literacy but still need some help in their writing skill. However, the curriculum implemented in the study program which is Indonesian National Qualification Framework, which links the alumni profile and the students' competency require them to master writing since many of the alumni profiles have strong relation with writing such as a teacher, a material developer, a writer, a researcher, etc. Hence, they have to be trained to master the skill well.

a. Conducting a goal analysis

To conduct a goal analysis, the writer did some efforts such as doing an interview and classroom observation

- – Interview.

  The data gained from the lecturers and the students are: 1) it is expected that the students are able to write well, especially an essay; and 2) it is expected that the lecturer uses interesting teaching technique to teach essay writing.

- – Classroom Observation.

  Classroom observation was conducted to find out problems that arise when the lecturers teach the students essay writing. The field note from the observation can be seen in table 2.

  Based on the results of observation and interviews, it can be inferred that the students need to master writing skill which is one of the requirements in the curriculum used and for their future job. Besides that, they also need to be taught using interesting teaching technique. On the other hand, the teaching techniques used by the lecturers

are quite various. From the result of the observation was presented in Table 2, it is clear that the students learn better when they are provided texts to be read as examples prior to writing their own essay.

Table 2. Observation Notes

Aspects being observed	Lecturer 1	Lecturer 2	Lecturer 3	Notes
Teaching technique	Reading activity prior to writing	Giving the topic and asking students to create outline prior to writing	Explaining theories related to writing	The most enthusiastic students observed were those taught by lecturer 1
Students' Activities	Having adequate ideas and starting to write	The writing is started the following week since the day was used to make an outline	Some students looked confused and some others looked for examples of the essay taught through the internet	Students who started writing immediately were those taught by lecturer 1

b. Identifying entry behavior characteristics

The characteristics of the students were traced by using questionnaire. From the result of the questionnaire filled out by the students, it is found that the students are still weak in their writing skill especially essay writing. However, they are good in using digital media which means that their digital literacy is good.

c. Formulating performance objective

From the curriculum of Indonesian National Qualification Framework, it is found that the students are expected to meet the competencies which are obtained from analyzing the profiles of the alumni. Most of the skill required is writing skill since the alumni profiles are among others: a teacher, a lecturer, a writer, a material developer, a translator, etc. Since the skill required is writing, the performance objective is the ability to write especially an essay with various kinds, among others are: descriptive, narrative, argumentative, and personal recount.

d. Developing Criteria-Referenced Test Items

The test item is in the form of writing. Hence, the students are asked to write both before and after the implementation of the learning model. This writing test is assessed using a standardized scoring rubric as can be seen from the figure 1.

e. Developing Instructional Strategy

The strategy developed is called as the implementation of ICT learning model which is integrated with the use of artificial intelligence. The ICT learning model here is taken from the concept developed by UNESCO. In the concept, the steps of ICT Learning model involve the steps of: accessing, understanding, processing, integrating, communicating, evaluating, and creating. In this research, the steps are added by one last step which is proofreading.

f. Developing and Selecting Instructional Materials.

The materials selected are essay writing including descriptive, narrative, personal recount, and argumentative.

g. Designing and Conducting formative Evaluation

Since the materials are related to writing, the formative evaluation is also creating an essay. The formative evaluation is divided into three steps namely: one to one evaluation, small group

evaluation and larger group evaluation. From all of the tests, it can be seen that the null hypothesis which says that the implementation of ICT learning model and the use of artificial intelligence does not affect the students; writing quality is rejected. Figure 1 shows the scoring rubric of essay writing.

RUBRICS FOR ESSAY

	FOCUS The single controlling point made with an awareness of task about a specific topic.	CONTENT The presence of ideas developed through facts, examples, anecdotes, details, opinions, statistics, reasons, and/or explanations.	ORGANIZATION The order developed and sustained within and across paragraphs using transitional devices and including introduction and conclusion.	STYLE The choice, use and arrangement of words and sentence structures that create tone and voice.	CONVENTIONS Grammar, mechanics, spelling, usage and sentence formation.
4	Sharp, distinct controlling point made about a single topic with evident awareness of task.	Substantial, specific, and/or illustrative content demonstrating strong development and sophisticated ideas.	Sophisticated arrangement of content with evident and/or subtle transitions.	Precise, illustrative use of a variety of words and sentence structures to create consistent writer's voice and tone appropriate to audience.	Evident control of grammar, mechanics, spelling, usage and sentence formation.
3	Apparent point made about a single topic with sufficient awareness of task.	Sufficiently developed content with adequate elaboration or explanation.	Functional arrangement of content that sustains a logical order with some evidence of transitions.	Generic use of a variety of words and sentence structures that may or may not create writer's voice and tone appropriate to audience.	Sufficient control of grammar, mechanics, spelling, usage and sentence formation.
2	No apparent point but evidence of a specific topic.	Limited content with inadequate elaboration or explanation.	Confused or inconsistent arrangement of content with or without attempts at transition.	Limited word choice and control of sentence structures that inhibit voice and tone.	Limited control of grammar, mechanics, spelling, usage and sentence formation.
1	Minimal evidence of a topic.	Superficial and/or minimal content.	Minimal control of content arrangement.	Minimal variety in word choice and minimal control of sentence structures.	Minimal control of grammar, mechanics, spelling, usage and sentence formation.

RUBRICS BY JENNY TUAZON
BSE_MATH

Fig. 1. The scoring rubric of essay writing

3.2 Discussion

This research employs research and development method aiming at producing a learning model to be used in teaching essay writing, developing students' skill on writing an essay and testing the effectiveness of the model. The study is started by identifying instructional goals, conducting a goal analysis, identifying entry behavior characteristics, formulating performance objective, developing criteria-referenced test items, developing instructional strategy, developing and selecting instructional materials, designing and conducting formative evaluation, and doing revision.

The Learning Need

At the beginning of the study, the learning needs are identified. The students need to master writing skill especially essay writing but their skill is observed to be low. The teaching techniques employed by the lecturers have not been able to help them solve the problem. After reading several literatures, the writers finally develop a learning model which integrates the students' digital literacy which steps are taken from the statements of UNESCO and their writing skill.

The Model Developed

The learning model developed is the integration of ICT learning model and the use of artificial intelligence to teach essay writing. Hence, the steps are: accessing, understanding, processing, integrating, communicating, evaluating, creating and proofreading. Actually, the

model offered by UNESCO is only until "creating" yet the writers add one step which is "proofreading". This is due to the need of the students to get some help related to the dictions, grammar, and mechanics. The digital literacy steps from UNESCO help them in constructing the idea and guide them from getting the idea to write until it becomes an essay.

4   Conclusion

There are two inferences resulted from the research. First, the research and development produce a learning model which is the integration of ICT learning model and the use of artificial intelligence to teach essay writing.   The steps that have been carried out include: identifying instructional goals, conducting a goal analysis, identifying entry behavior characteristics, formulating performance objective, developing criteria-referenced test items, developing instructional strategy, developing and selecting instructional materials, designing and conducting formative evaluation, and doing revision. While the learning model has the steps as follows: accessing, understanding, processing, integrating, communicating, evaluating, and creating. Second, based on the validation from experts, it is known that the score reaches 3.61 for the materials which means good and the expert on learning model gives score of 3.71. The result of interview and questionnaire show that the learning model is effective.

Acknowledgement

References

[1]   [1] Z. Ahmad, "Analyzing Argumentative Essay as an Academic Genre on Assessment Framework of IELTS and TOEFL," in English Language Teaching Research in the Middle East and North Africa: Springer, 2019, pp. 279-299.

[2]   S. Kaur, "Teaching strategies used by Thai EFL lecturers to teach argumentative writing," Procedia-Social and Behavioral Sciences, vol. 208, pp. 143-156, 2015.

[3]   J. E. Dockrell, C. R. Marshall, and D. Wyse, "Teachers' reported practices for teaching writing in England," Reading and writing, vol. 29, no. 3, pp. 409-434, 2016.

[4]   M. I. Mahmood, M. Mobeen, and S. Abbas, "Effect of High-Stakes Exams on Creative Writing Skills of ESL Learners in Pakistan," Research Journal of Social Sciences and Economics Review (RJSSER), vol. 1, no. 3, pp. 169-179, 2020.

[5]   I. Solikhah, "KKNI dalam kurikulum berbasis learning outcomes," LINGUA: Jurnal Bahasa, Sastra, dan Pengajarannya, vol. 12, no. 1, pp. 1-22, 2015.

[6]   A. A. Jono, "Studi implementasi kurikulum berbasis KKNI pada program studi pendidikan bahasa inggris di LPTK se-kota Bengkulu," MANHAJ: Jurnal Penelitian Dan Pengabdian Masyarakat, vol. 5, no. 1, 2016.

[7]   H. Salikin, S. Z. Bin-Tahir, R. Kusumaningputri, and D. P. Yuliandari, "The Indonesian EFL Learners' Motivation in Reading," English Language Teaching, vol. 10, no. 5, pp. 81-90, 2017.

[8]   C. Vögelin, T. Jansen, S. D. Keller, N. Machts, and J. Möller, "The influence of lexical features on teacher judgements of ESL argumentative essays," Assessing Writing, vol. 39, pp. 50-63, 2019.

[9] S. S. K. Ibnian, "Brainstorming and essay writing in EFL class," Theory and Practice in Language Studies, vol. 1, no. 3, pp. 263-272, 2011.

[10] S. Sukmawan, L. Setyowati, and A. Nurmansyah, "Mendayagunakan genre sastra flash fiction untuk menulis teks argumentasi," Jurnal Ilmiah Edukasi & Sosial, vol. 6, no. 1, pp. 84-95, 2017.

[11] R. Roslaini, "METODE MIND MAPPING DALAM PEMBELAJARAN MENULIS ESAI ARGUMENTATIF," in Prosiding Seminar Nasional Pendidikan, 2018, vol. 1, no. 1.

[12] N. Law, D. Woo, J. de la Torre, and G. Wong, "A global framework of reference on digital literacy skills for indicator 4.4. 2," UNESCO Institute for Statistics (UIS/2018/ICT/IP/51), 2018.

[13] A. K. A. Faraj, "Scaffolding EFL Students' Writing through the Writing Process Approach," Journal of Education and Practice, vol. 6, no. 13, pp. 131-141, 2015.

[14] G. L. Nelson and J. M. Murphy, "Peer response groups: Do L2 writers use peer comments in revising their drafts?," TESOL quarterly, vol. 27, no. 1, pp. 135-141, 1993.

[15] M. Gardner et al., "Allennlp: A deep semantic natural language processing platform," arXiv preprint arXiv:1803.07640, 2018.