College students’ perceptions of using an online automated essay scoring system

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Abstract

With an ever-increasing use of technology in language learning, a vast variety of online Automated Essay Scoring (AES) systems has been developed and applied in English as a Foreign Language (EFL) writing class. By providing instant feedback to the learners in their writing process, the system is used in and outside of the class to improve students’ writing skills. Among all the systems, the PIGAI system is the most commonly used writing tool in China. This study aimed to investigate college students’ perceptions and writing performances following the use of the PIGAI system in their English writing class. The current research adopted both quantitative as well as qualitative methods on 25 college students taking English Writing Course. The results indicated that students took a positive attitude toward using the PIGAI system, especially in the aspects of vocabulary and grammar. It is interesting to note that students at a higher level of English proficiency argued the system sometimes gave them confusing information and scores lower than expected. Moreover, they pointed out that the teacher’s feedback is equally necessary for their writing process. By contrast, students at a lower English level of proficiency considered that it was a good writing tool to help them boost their writing confidence before submitting an essay to the teacher. Our empirical findings highlight the importance of teachers and researchers appreciating the need for proper, balanced use of both the AES system and the teacher’s feedback in a writing class when designing the course plan.

Keywords: AES, PIGAI System, College English Writing

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INTRODUCTION

Acquiring writing skills is one of the most difficult tasks for language learners. Over a long time, even though English teachers put a lot of effort into teaching writing, students still lack in motivation and afraid of it. In a traditional English writing classroom, teachers must face and correct a huge number of students’ writing essays in terms of grammatical errors, sentence structure, vocabulary usage, spelling, punctuation, organization, etc. Students may then modify their essays based on teachers’ comments. However, they make the same errors repeatedly and teachers will need to correct the same thing again. It not only wastes teachers’ time, but students lose their self-efficacy in writing (Hilao, 2016; Wu, 2017).

With the tremendous grown of computer technology, it has brought humans into a new era. Under these circumstances, researchers and teachers all around the world have been integrating technology with education. Educators in many countries have set up a Massive Open Online Course (MOOCs) for students to learn. For example, Stanford University has provided more than 181 MOOCs courses in different subjects so that learners around the world can get access to the course and learn at their own pace for free. In recent years, the South Korean government has also put emphasis on a U-learning program, which is based on e-Learning. Schools use ubiquitous technology to create an e-learning environment. The classroom is arranged for group discussion instead of a traditional classroom setting. This program enables frequent interactions between teachers and students through the internet. Also, it cultivates students’ abilities in autonomic learning.

The increased use of technology in a language learning classroom brings new, fascinating perspectives for language writing instruction (Hashim, Salam, & Mahfuzah Mohamad, 2017; Smart & Cappel, 2006). Many AES online systems have been developed and can be used for both teachers and students, including Project Essay Grade,
Intelligent Essay Assessor, PaperRater, Bayesian Essay Test Scoring System, and Pigaiwang. The AES is the use of computer programs that can give scores and provide comments for learners’ writing. Among these AES tools, Pigaiwang is an AES tool with more than 4 billion essays corrected nowadays. It was developed by language teachers, educators, and technology experts in China. Many researches have shown that it improves learners’ writing skills and self-efficacy to some degree individually (Fang, 2010; He, 2016; Taher, Shrestha, Rahman, & Khalid, 2016; Tang & Wu, 2011; Tan, 2019). However, both teachers and developers of AES need a better understanding of how students perceive and reflect on the functions of the program. This research aimed to investigate students’ perceptions of and reactions to AES programs. The results may help shed light on essential aspects of using the AES and teachers’ feedback in writing instruction.

LITERATURE REVIEW

A Brief Overview of AES-Pigaiwang

In a learning context, the automatic essay scoring system (engine) can be used as a formative assessment in the writing classroom. The engine is to generate comments and the sole score for every single student’s writing essay. While on a standard English proficiency exam, it is used by learners as a practice tool to improve their score on TOEFL iBT and IELTS tests. “Pigaiwang” is one of the most commonly used AES engines in China, which is based on corpuses and big data. According to its criterion, abundant researches have indicated the system is reliable, valid, and fast in writing quality (Boonyarattanasoontorn, 2017; Yang & Dai, 2015; Zhang, 2017). The system can ease teachers’ loading by providing immediate feedback on grammar errors, vocabulary usage, mechanics, sentence structure, spelling, discourse structure, and source use. In addition to the features, peer review, sample article reading, plagiarism checking, and some administrative settings can be used depending on the teacher’s different task requirements.

Without any need for installing any software, both teachers and students can access the system by registering for their accounts with an email address. On the teacher’s webpage, he/she can assign writing tasks with the requirement. The students submit their writing to the system from the student’s webpage. Pigaiwang generates feedback and scores instantaneously. Based on the feedback, students can correct their writing essays as many times as they desire until they obtain a satisfactory score. Then the teacher receives students’ writing data like students’ writing portfolios.

Today, it usually takes weeks for students to modify and complete a writing essay. As a result of immediate feedback, students can then make an improvement in their writing efficiently and complete the writing assessment sooner than before.

RESEARCH METHODOLOGY

Research Subjects

In the spring semester of the academic year 2018, 30 students took the writing course as a requirement of the interdisciplinary program. Five students out of 30 never showed up or dropped the class in three weeks. Students’ levels of English proficiency varied due to the fact that there were no prerequisites or any other limitations on taking this course. In the first month of the class, the instructor required students to complete two writing essays by using Pigaiwang. Students were asked to fill in a questionnaire after experiencing the system. Some follow-up qualitative questions would be used to interview students with different English proficiency.

Research Questions

The main purpose of this study was to investigate students’ perceptions and writing performances after using the PIGAI system in their English writing class. The mix research methodology was applied in this research in order to answer the following research questions:
1. What do the students think about college English Writing?
2. Will the students’ English proficiency levels affect their perceptions of Pigaiwang?
3. How do students perceive the pros and cons of Pigaiwang after using it?

The Research Instrument
For the quantitative method, this research adopted a questionnaire developed by Professor He, Huaqing at China West Normal University in 2016. The questionnaire consisted of three parts, including the subject’s background information, learner’s perception of college English writing, and learner’s satisfaction in using Pigaiwang. Eighteen Likert scale questions (1 for strongly disagree, 2 for disagree, 3 for not sure, 4 for agree, and 5 for strongly agree) were given in the last two parts. For the qualitative method, interviews with a total of 6 participants selected randomly from the different English proficiency groups in this study took place following the completion of the survey.

RESULTS

Subject Background Information

There were 8 male and 17 female students participating in the current research. Nine students were majors in English, six in Business, four in Journalism, three in Education, two in Russian, and one from the Art Department. Eighty-eight percent of the students had never used the AES engine regarding their writing process, while only 3 students from China did use the AES for at least 2 years. Based on the subjects’ TOEIC English Proficiency scores, the students were divided into three different English levels: 6 students at the Advanced level, 9 students Intermediate level, and 10 students Upper-beginning level.

Research Question I

What do the students think about college English Writing?

Table 1 makes clear students’ perceptions of aspects of English writing. On the whole, most of the students considered English writing as difficult (Mean = 4.48). In respect of all the writing elements, our data suggested that students found grammar was the most difficult element (Mean = 4.44), with organization coming next (Mean = 4.40), followed by vocabulary usage (Mean = 4.24). Finally, it also reports on other elements, namely spelling (Mean = 4.04), sentence structure (Mean = 4.00), as well as content (Mean = 3.96), respectively.

Table 1: Students’ Perceptions of English Writing

<table>
<thead>
<tr>
<th>Element</th>
<th>Means</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing important</td>
<td>4.44</td>
<td>.583</td>
</tr>
<tr>
<td>Writing difficult</td>
<td>4.48</td>
<td>.653</td>
</tr>
<tr>
<td>Vocab. difficult</td>
<td>4.24</td>
<td>.970</td>
</tr>
<tr>
<td>Grammar difficult</td>
<td>4.44</td>
<td>.768</td>
</tr>
<tr>
<td>Content difficult</td>
<td>3.96</td>
<td>1.020</td>
</tr>
<tr>
<td>Organization difficult</td>
<td>4.40</td>
<td>.577</td>
</tr>
<tr>
<td>Spelling difficult</td>
<td>4.04</td>
<td>1.098</td>
</tr>
<tr>
<td>Sentence Structure difficult</td>
<td>4.00</td>
<td>1.000</td>
</tr>
</tbody>
</table>

N = 25

Research Question II

Will the students’ English proficiency levels affect their perceptions of Pigaiwang?

Table 2 shows students’ perceptions of the use of Pigaiwang. It is clear to note that the organization obtained the lowest score, while vocabulary and grammar correction had the highest scores regarding their satisfaction with Pigaiwang.

Table 3 indicates that students with advanced English proficiency had lower satisfaction than students with upper beginning English proficiency. It is interesting to note that students across different English proficiency levels considered grammar correction to be the most useful feature of Pigaiwang. Students did not feel confident about this AES engine being able to help them with essay organization, though.
Tsai et al., / College students’ perceptions

Table 2: Students’ Perceptions Pigaiwang

<table>
<thead>
<tr>
<th></th>
<th>Means</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with AES</td>
<td>3.16</td>
<td>.926</td>
</tr>
<tr>
<td>Satisfaction with scoring</td>
<td>4.15</td>
<td>.943</td>
</tr>
<tr>
<td>Satisfaction with vocab.</td>
<td>4.60</td>
<td>.645</td>
</tr>
<tr>
<td>Satisfaction with grammar</td>
<td>4.60</td>
<td>.500</td>
</tr>
<tr>
<td>Satisfaction with content</td>
<td>3.60</td>
<td>1.291</td>
</tr>
<tr>
<td>Satisfaction with organization</td>
<td>3.36</td>
<td>1.254</td>
</tr>
<tr>
<td>Satisfaction with spelling</td>
<td>4.64</td>
<td>.569</td>
</tr>
<tr>
<td>Satisfaction with sentence structure</td>
<td>3.88</td>
<td>1.130</td>
</tr>
</tbody>
</table>

N = 25

Table 3: Students’ Perceptions Pigaiwang

<table>
<thead>
<tr>
<th></th>
<th>Students at Advanced level</th>
<th>Students at Intermediate level</th>
<th>Students at Upper-beginning level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with AES tool</td>
<td>2.83</td>
<td>3.83</td>
<td>4.7</td>
</tr>
<tr>
<td>Satisfaction with scoring feature</td>
<td>3.00</td>
<td>4.11</td>
<td>4.5</td>
</tr>
<tr>
<td>Satisfaction with vocab. feature</td>
<td>3.83</td>
<td>4.00</td>
<td>4.8</td>
</tr>
<tr>
<td>Satisfaction with grammar feature</td>
<td>4.00</td>
<td>4.67</td>
<td>4.9</td>
</tr>
<tr>
<td>Satisfaction with content feature</td>
<td>2.83</td>
<td>3.56</td>
<td>4.2</td>
</tr>
<tr>
<td>Satisfaction with organization feature</td>
<td>2.67</td>
<td>3.42</td>
<td>4.0</td>
</tr>
<tr>
<td>Satisfaction with spelling feature</td>
<td>4.00</td>
<td>4.67</td>
<td>5.0</td>
</tr>
<tr>
<td>Satisfaction with sentence structure feature</td>
<td>3.00</td>
<td>3.87</td>
<td>4.4</td>
</tr>
</tbody>
</table>

N = 25

Research Question III

How do students perceive the pros and cons of Pigaiwang after using it?

In the interview, I selected two students from each different English level. Two students from the advanced level were decoded as AESA1 and AESA2, and two from the intermediate level were decoded as AESI1 and AESI2, while the other two from the upper-beginning level were decoded as AESUB1 and AESUB2.

When asked about the pros and cons of Pigaiwang, all students in the interview hold positive views on the immediate feedback and scoring function of it. Moreover, they think the lexical comment is helpful.

AESA1 said, "I really like this program. I can procure my score right on the bat and knowing my writing is above the average."

AESA2 replied, "Sometimes I don’t know the phrases or the words, Pigaiwang gave me a suggestion. I don’t need to waste time to check on the dictionary. Also, it corrects my grammar errors so I don’t have to worry about my poor grammar."

AESUB1 answered, "My English really good; I write not thinking too much because I know it can help me to correct like word system. But Pigaiwang is better than a word. I can get a more higher score than I think I can get. I just need to follow the comment and correct it so many times."

However, both students with advanced proficiency have negative perceptions related to the system.

AESA1 mentioned, "When I need the structure comment, Pigaiwang cannot satisfy me. It always gave me weird sentences. If I didn’t follow the comment, I might get a lower score. Instead, In order to gain a higher score, I have to follow the weird suggestion. I saw my peer with a higher score than mine but their writing is not as good as mine. This made me really angry."

AESA2 said, "The program cannot provide good writing ideas for me. I know how to write the thesis statement and topic sentences when I am planning my writing. However, when I need some suggestion about the
supporting information or details, the system is kind of dumb and keep repeating the same and unrelated suggestions that it had provided before. I think I need my teacher’s guidance at this point.”

DISCUSSION AND CONCLUSION

As indicated in Bransford, Brown, and Cocking (2000), learning is promoted when students are actively involved in their learning process. Meanwhile, it is remarkable that students can cultivate their critical thinking skills through reflective activities (Sarason & Banbury, 2004). In other words, if a student can think about what they are doing in their learning process, it will result in a positive and long-term learning outcome. Pigaiwang creates an interactive learning environment in which students engage in reflective activities and construct new knowledge. According to the results of this study, Pigaiwang has a positive influence on the students’ writing process. For example, students with intermediate and lower English proficiency exhibited more confidence in English writing before submitting their final draft, given that they could rely on the comments provided by the system.

Nonetheless, there are some downsides to the system, such as a lack of credibility in linguistic analysis and the imperfection of providing lexical usage. The higher-level students in the investigation have pointed out that some incorrect suggestions may have led to confusion as they wrote. The system did reduce the teacher’s burden in grading students’ writing essays. However, this does not amount to saying that teachers have no responsibilities for students’ writing. Fundamentally, educators should appreciate that a computer device cannot provide comments in precisely the same way as a teacher does. The problems with modularization and mechanization still exist. They should have insight about when, where, and how to apply or combine teacher feedback when using the AES system in a writing class. Complementary research should focus on a comparative study dealing with teacher feedback, peer feedback, as well as AES feedback. Additionally, frequent misuse of collocations, lexical items, and linguistic structures can be further explored and analyzed for future reference in the context of teaching writing.

REFERENCES


