The Effects of Asynchronous Computer-Mediated Communication (ACMC) on Multimedia University ESL Students' Writing Performance

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A R T I C L E   I N F O

A B S T R A C T

Background: In learning English, writing is one of the skills where students are least proficient in. Objective: This study aimed at investigating the perception of writing difficulties and the effects of using asynchronous computer-mediated communication (ACMC) in terms of writing content, vocabulary, language, organization and mechanics on Multimedia University ESL students' writing performance. The subjects were 70 foundation students majoring in Management at the Multimedia University Melaka, Malaysia participating in a 5 weeks English writing class. The students were divided into two groups (control and experimental groups) and used Facebook as a platform of ACMC. Methodology: Both qualitative and quantitative approaches were employed in this study. The research instruments were survey questionnaire, pre-test and post-test of English essay writing and interviews. Results: The findings revealed students' diverse range of writing difficulties perceptions and students' improvement in their language and writing organization when ACMC is integrated in their English writing. Conclusion: It is concluded that students who are taught English writing with the intervention of ACMC can achieve higher mean scores for all 5 different variables as compared to students who are not exposed or given an additional lessons on ACMC.

INTRODUCTION

For many decades, educators have been using computers in second language teaching but the rapid development of computer technologies have changed our daily lives in general and in language classrooms in particular. The influence of computer technologies in our daily lives and academic environments has transformed mode of communication from analog to digital. This changes the way people communicate and this new variety of communicational tools has affected language teaching (Ware & Warschauer, 2006; Warschauer 1999; Aronowitz, 1992). Teaching is no longer confined to the boundary of the classroom. With the accessible usage of Internet, Computer-Mediated Communication (CMC) has been one of the widely used communication modes in the field of education for the past few decades, regardless of synchronous or asynchronous.

Facebook is considered as one of the tools of Asynchronous Computer-Mediated Communication (ACMC). This tool is indeed convenient for the students as they need not log-on simultaneously in order to communicate with one another unlike Synchronous Computer-Mediated Communication (SCMC). This flexibility allows the students to communicate at a comfortable environment and convenient time as they have classes or co-curriculum activities to attend. According to Facebook newsroom, as of September 30, 2013, there are 1.19 billion active monthly users of Facebook account. Approximately 80 per cent of their daily active users are out of United States and Canada. A research on Malaysian Facebook users in May 2013 showed that 13.3 million or 45.5 per cent of the total population in Malaysia are Facebook users, and Malaysia is ranked number 8th in Asia and 21st place in the world. From the total figure, those aged between 18 and 24 were the highest users, contributing 34.5% followed by those aged 25-34 years (29.5%) and 13-17 years (16.3%). Due to its popularity, wide and cost-free usage of Facebook, the researcher will be using it as a platform for this study.

Two objectives were drawn up to provide a sense of direction for the researcher to carry out this study successfully. The two objectives of this research are as follows:
1. to examine pre-university ESL students' perceptions about writing in second language.

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2. to investigate the effects of using asynchronous computer-mediated communication (ACMC) in terms of writing content, vocabulary, language, organization and mechanics on Multimedia University ESL students' writing performance.

Through this study, we are able to obtain information from a small group of ESL students on their perceptions, feelings and experiences regarding the difficulties in learning to write in second language (L2). In addition to that, ESL writing educators are able to gain some insights on the difficulties faced by pre-university ESL students' acquisition of academic writing. Thus, from the findings, ESL writing educators are able to make changes in their teaching methodology focusing on student-centered via technology rather than traditional teacher-centered method. It is vital to keep abreast with the new online communicational tools (for example Facebook) as it is used daily in most of our students' lives, and it has great influence in language education because interaction is no longer limited to the classroom interaction (Warschauer, 1997). With computer-mediated communication (CMC), it allows students to have easy access to the language which is important to increase the usage and exposure of the target language. Furthermore, the results of this study will contribute to the pedagogical and methodological implications of integrating ACMC via Facebook into teaching writing to ESL students.

Literature review:

Computer Mediated Communication (CMC) is a type of communication between humans that is facilitated by computers and telecommunication network. Synchronous communication (real-time communication) and asynchronous communication (non-real-time communication) are the two forms of CMC. Asynchronous messages such as e-mails and discussion boards allow the users to access at any time and to reply to any messages more than once. It does not happen in real-time as compared to synchronous (chat rooms, video conferencing or face-to-face communication). On the other hand, asynchronous computer-mediated communication (ACMC) allows learners especially language learners to actively participate in exchanges with a wider range of speakers or participants as the exchanges are both independent to place/setting and time (Kitade, 2008). Other than providing real online communities to the learners, ACMC offers an exclusive interactional feature that assists the learning of the second language (L2).

Asynchronous tools allow communication and collaboration to occur regardless of the different time or place of the participants, and it connects users at their own free time and convenience. These tools are essential in maintaining conversation and collaboration at a different time interval, and it offers instant accessible resources and information regardless of the time and advantageous in connecting users from different time zones. Besides, asynchronous tools allow the users to save their group interactions which allow it to be shared and distributed to other users who are unable to be online at the same time. All of these tools are limitless in time, and it increases the benefits of text-mediation. ACMC is as beneficial as conventional writing and Lapadat (2002) concurs that online users do take time to think about what to say and convey on the ACMC, and even though these users tend to use lesser words, their contributions to the discussion are likely to be well-thought of, adapt to the audience, contain specific meaning, be coherent, and complete.

Mubarak (2012) concurs and highlights that students especially English as Foreign Language (EFL) students have lesser opportunities to use English outside the classroom. The effectiveness of Facebook as a tool of teaching and learning languages is highlighted by some previous works such as Mills (2009) and Blattner and Fiori (2009), and Muñoz and Towner (2009).

Mills (2009) stated that Facebook can be a valuable learning environment to practice and engage in learning a foreign language (French). Her research indicates that Facebook is able to provide an authentic environment for interaction and communication in French which assist the students in learning the grammatical, functional, and linguistic objectives of the French language course. On the other hand, Blattner and Fiori (2009) highlighted how Facebook can provide language learners with opportunities to develop their socio-pragmatic competence (an aspect of language acquisition), through authentic language interaction and indirectly Facebook is able to enhance a sense of community in language classrooms.

Reid (2001) highlighted that English language learners (ELL) face difficulties in writing as they lack lexical resources, they exhibit less ability to intuitively revise through oral instruction, and they write shorter texts with more errors. Second language writing requires ELL writers to write using correct English spelling, vocabulary, mechanics and syntax, and to organize their ideas into logical discourses that can fit American composition schema and rhetorical styles. It shows that ELL writers cannot continue following their inherited patterns of discourse from their first language (L1), and they need to learn new ways of thinking, organizing, and writing ideas in English (Kaplan, 1972). Furthermore, ELL writers are commonly known to write English composition following their L1 syntax, thought, and rhetorical patterns. Therefore, it is necessary to establish the writing needs of students for whom English is a second language.

On the other hand, Computer-Supported Collaborative Learning (CSCL) is able to contribute to studies on ESL learners' writing performance by incorporating Online Collaborative Writing into the

teaching and learning. In recent years, with the rise of the Internet, Collaborative Writing has broadened to embrace the concept of online as a medium of the writing process. The new ability of a networked computer, manipulated by the human mind as a mediator of communication, can have a huge impact on how writing is taught and learned. Online collaborative writing can be defined as a pedagogical approach that is enhanced and supported by computer shared applications and is facilitated and prompted online by the synchronous and asynchronous computer mediated communication.

Several studies on English as Second Language (ESL) learners' writings have explored the potential of collaborative learning text in writing activities such as story joint writing (Swain & Lapkin, 1998), revision (Villamil & de Guerrero, 1998), and joint reflection with native speakers on revised text (Swain & Lapkin, 2002; Tocalli-Beller & Swain, 2005). Peer collaboration during writing or revision has been recognized as an effective technique for enhancing the writing skills of ESL learners (Cumming, in Villamil & de Guerrero, 1998). Several studies discussed below claim that peer dialogue plays a crucial role in ESL learning.

Lindblom-Ylanne and Pihlajamaki (2003) examined on whether a computer supported learning environment enhances essay writing. The results showed that the students deepened their understanding, elaborated their own ideas, improved critical and independent skills, and developed self-regulative skills. Furthermore, the active use of a computer supported learning environment was related to good essay grades. Meanwhile, in his study, Tuzi (2004) found that although students preferred oral feedback, e-feedback had a greater impact on revision, helping ESL writers focus on adding new information to the original text. In addition, e-feedback affected ESL writers' revision at a higher structural level, such as revisions at the sentence and paragraph levels.

Researchers who look at the complexity of syntax in asynchronous discussions state that the delayed nature of asynchronous discussions provides learners with more opportunities to come up with complex sentences. Sotillo (2000) states that language learners used more of subordinate and embedded subordinate clauses in their writing, and asynchronous discussions allowed the learners to plan their ideas and revise back on their writings. Asynchronous discussions also allowed the students to be involved in the construction of meaning exchanges between expert, and novice and the students gained more skills through the interaction and discussion (Weasenforth & Meloni, 2002; Chung, Graves, Wesche, & Barfurth, 2005). Meanwhile, Alias and Hussin (2002) also highlights the facts that on-line forum, e-mail exchanges and information are useful to the students' writing process. Sotillo (2000) found that the learners

discourse functions are more controlled and it reflects a discussion during traditional classes while synchronous discussion showed that the learners participate actively in the discussions and employed a wider scope of discourse functions during the exchanged of information and ideas

Locally, few studies have been conducted on ACMC and collaborative learning such as studies by Halizah Omar, Mohammed Amin Embi & Melor Md Yunus (2012); Lin Siew Fong (2012) and Fariba Ataie (2013). Halizah Omar, Mohammed Amin Embi & Melor Md Yunus (2012) have conducted a study with the aims to investigate ESL learners' participation in an information-sharing task conducted via Facebook groups and their feedback on the use of Facebook groups as the platform for the activity. Their analysis showed the learners' do contribute to the online group discussion even though they are considered as limited language users. Thematic analysis showed that information-sharing task via Facebook was favoured by the students, and Facebook would be a favourable online collaborative tool in promoting interaction in English learning context. Any online activities are able to motivate learners in practicing and communicating in English. Lin Siew Fong (2012) had conducted a study analysing the collaborative writing sessions of two groups of advanced diploma economics students with mixed proficiency. The study showed that collaborative writing done via Facebook does benefit the students in term of increasing their ownership and responsibility towards their work, encouraging them to share new information and expertise and negotiating successfully via Facebook which was used outside of their class discussion.

Another study by Fariba Ataie (2013) looked at Facebook's potential in collaborative learning for International Islamic University postgraduate students. The research findings showed that the students believe that collaborative learning allows them to easily interact with their teacher and course mates, and indirectly it enhances their competence of the language. The researcher concluded that Facebook is a valuable tool in innovating and enhancing learning process between the students.

Methodology:
70 students participated in this study. They were divided into the control and experimental groups. There were three types of instruments used in this study. They were survey, test and interview. This survey consists of three sections. Section A was aimed at gathering personal information of the learners, section B was designed to collect information on students' usage of computer, the Internet and Facebook (the intervention) and section C was aimed to measure students' self-perception of his/her writing difficulties in English language and their feelings about English composition. In answering research question 2, pre-test and post-test

methods were being used. Inferential statistics was used to analyze the effects of ACMC on pre-university ESL students' writing performance. The third method used in this study was interview.

Purposive sampling method was used to select the students from the experimental group for an interview session in order to support the data analysis.
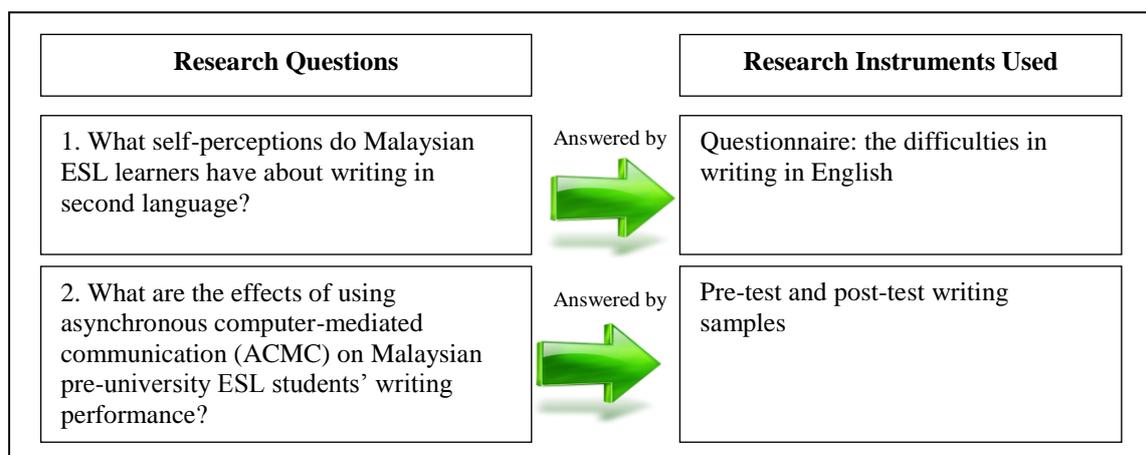
Research Questions		Research Instruments Used
1. What self-perceptions do Malaysian ESL learners have about writing in second language?	Answered by	Questionnaire: the difficulties in writing in English
2. What are the effects of using asynchronous computer-mediated communication (ACMC) on Malaysian pre-university ESL students' writing performance?	Answered by	Pre-test and post-test writing samples

Fig. 1: Research questions and research instruments used.

Survey:

The survey was adapted from Show Mei Lin (2009) which was developed based on literature review of English language learners (ELL) writing difficulties. It consists of 54 items. In section A, there are 7 items related to demographical information; in section B, there are 5 items related to student's computer and Internet usage and in section C, there are 42 items related to student's self-perception of his or her writing difficulties.

Section A contains students' ages, gender, country of birth, race, first language, former secondary school and the number of years spent learning English composition. Section B contains questions on the number of hours students spent on using the computer and browsing the Internet per day. Besides that, the items aimed at gathering information on Facebook users, finding the number of hours spent on Facebook per day and enquiring those who are familiar with Facebook setting. In section C, there are 42 items which inquired the student's degree of writing difficulty, problem solving strategies with writing difficulties, and the student's feelings towards writing in English. In this survey, a six-point Likert scale was used. It contained the following options: (1) Strongly Disagree, (2) Disagree, (3) Somewhat Disagree, (4) Somewhat Agree, (5) Agree and (6) Strongly Agree. The rationale for using this even number Likert scale is to avoid problems with neutral non-opinion option. According to Brown (2001), most respondents tend to choose neutral option where definite opinion is not stated but through a six-point Likert scale, it gives no option for respondents not to take a stand.

Pre-test and Post-test:

In answering research question 2, pre-test and post-test methods were used. Students were given a question on cause and effect essay to answer within 40 minutes. The essays were marked based on the rubrics adapted from the work of the Northwest Regional Educational Laboratory and Reid.

Interviews:

For the interview sessions, the researcher used purposive sampling method to select three students from the experimental group who have scored the highest, average and lowest in the post-test. Personal interviews, approximately twenty minutes, were conducted to gather detailed information on their perception of writing difficulties in English and their opinion on the usage of ACMC in their writing. Five interview questions were asked and the interviews were recorded via mobile phone recording.

Research Procedures:

The questionnaires were given to the respondents via face-to-face in a classroom. These questionnaires were collected and analysed. After answering the questionnaire, both groups of students sat for a pre-writing test, answering one essay question within 40 minutes. Both groups were taught the fundamental writing skills, focusing on cause and effect essay in class for three hours a week for five weeks. In week one, students were taught the writing processes (prewriting, planning, drafting, revising, editing and publishing stages) and constructing thesis statement and topic sentences. In week two, students learned and practiced to write introductory paragraph which consists of hook sentence, relevant details and thesis statement. In week three, students were taught to write body paragraphs. They learned to write topic sentences, supporting detail sentences and

concluding sentences in a body paragraph. In week four, students learned to write concluding paragraphs. In week five, students learned to write a full five paragraph essay. As for the experimental group, ACMC was used as a tool outside of the classroom environment to communicate with one another and to do their writing tasks via Facebook messaging. At the end of week five, a post-test was conducted for both groups. The findings derived from the pre-test and post-test of the experimental and control groups were used for answering research question number 2. The students' essays were marked according to the rubrics adapted from the work of the Northwest Regional Educational Laboratory and Reid. By using Microsoft Excel 2013, statistical analysis of t-test was used to compare the mean scores of their writing performance by looking at writing content, vocabulary, language, organization and mechanics for the control and experimental groups. This statistical analysis allowed the researcher to make inferences about the effects of using ACMC in teaching students English writing. Besides statistical analysis, interview sessions were also conducted on 3 students from the experimental group to gain a better insight on students' perception towards the difficulties in writing in English and the integration of ACMC in writing.

Result:

Data analysis takes place once all of the items in the questionnaires are tabulated in order to answer research question 1.

Section A: Samples and Profiles:

The number of males and females was not equal in the sample due to the preference of students who enrolled for Foundation in Management course. 60.0% (n = 42) of the sample of this study were females while 40.0% (n = 28) were males. Majority of the students (84.29%, n = 59) were 19 years old, while 8.57% (n = 6) of the students were 20 years old. 2 of them (2.86%) were 21 years old and 2 students (2.86%) were 22 years old. However, there was only 1 student (1.43%) who was older than 23 years old. Majority of the students (n = 68) are Malaysian except 2 of the students who were Sudanese. Out of the 68 Malaysian students, 66 of them were from Peninsular Malaysia and 2 were from East Malaysia (Sabah/Sarawak). 77.14% (n=54) were Chinese, 12.86% (n=9) were Indian and 7.14%

(n=5) were Malay. There were 2 students of African nationality (2.86%). As for the students' first language, majority speak Mandarin (70.00%, n=49) followed by Tamil as the second highest (12.86%, n=9) and English as the third highest (8.57%, n=6). Those who speak Malay as their first language comprises of 5.71% (n=4), and other languages recorded at 2.86% (n = 2). All the Malaysian students which constitute to 85.71% (n = 60) were from Sekolah Menengah Kebangsaan (National High School) whereas 11.43% (n=8) were from Sekolah Menengah Jenis Kebangsaan (National Mix High School) and 2.86% (n=2) was recorded under the category of others former secondary high school. These came from the 2 Sudanese students. 98.57% (n=69) of the students were found to have an experience of 11 to 15 years of writing in English. Only 1.43% (n=1) of the students was found to have an experience of 6-10 years of writing in English. None was recorded to have any experience below 5 years of writing in English.

Section B: Computer and Internet Usage:

The survey found that the lowest number of students (8.57%, n=6) spent an average of 3 hours using the computer daily compared to the highest number of students (31.43%, n=22) who spent an average of 5 hours daily. As for the daily Internet usage, majority of the students 38.57% (n=27) spent an average of 4 hours. From the questionnaire, 100% of the students stated that they do have a Facebook account. Majority of the students (42.86%, n=30) spent an average of 4 hours daily on Facebook.

Section C: Perception of Writing Difficulties:

Perception on writing in English as a second language is being measured by using a six-point Likert scale for all the 42 items. In an overview of the items, it is revealed that learners generally picked choice number 3 (Somewhat disagree) or 4 (Somewhat agree) in the Likert scale for most of the 42 items. For every item, only a small proportion of students picked choice number 1 (Strongly disagree) or 6 (Strongly agree) in the Likert scale for all 42 items.

In answering research question number 2, the researcher uses t-test to determine if there is significant difference between the mean scores of the pre-test and the post-test for the control group and the experimental group.

Table 1: Independent t-test for control group: pre-test and post-test.

Variable		Mean	Variance	Significant value
Content	Pretest	6.2581	3.9812	0.9409
	Posttest	6.2258	1.8473	
Vocabulary	Pretest	1.7580*	0.2478	0.0000
	Posttest	2.7742*	0.1306	
Language	Pretest	3.7742*	1.9806	0.0020
	Posttest	4.7742*	0.9973	
Organization	Pretest	1.9677*	0.4656	0.0000

	Posttest	2.9677*	0.4156	
Mechanics	Pretest	1.1290*	0.4495	0.0101
	Posttest	1.5484*	0.3226	

*p value at 0.05

In the t-test for two samples, five variables were considered. The variables are "content", "vocabulary", "language", "organization" and "mechanics". In the t-test comparing the means of the pre-test and post-test of the control group, "content" value of 0.9409 is obtained, and it is not significant. That means after the face-to face method of teaching for 5 weeks, students were still having difficulties with their writing content, formulating thesis statement, pausing many times to think about what to write and facing trouble to focus on ideas. "Vocabulary" is significant at 0.0000. Students showed improvement in word choice and usage of idioms compared to their perception. "Language" is significant at 0.0020. Students have sharpened their grammar skills by avoiding sentence fragment, preposition errors, run-ons and word order. "Organization" is significant at 0.0000. This showed that students were able to organize their ideas better after they were taught the fundamental writing skills, focusing on cause and effect essay in classroom using face-to-face methodology for 5 weeks. "Mechanics" is significant at 0.0101. The result showed that the control group has improved on their punctuation and spelling. In short, there were significant differences in means scores between the pre-test and post-test in the control group for all variables except "content".

Table 2: Independent t-test for experimental group: pre-test and post-test.

Variable		Mean	Variance	Significant value
Content	Pretest	6.7564	2.3141	0.4212
	Posttest	6.5385	0.5182	
Vocabulary	Pretest	2.0385*	0.0840	0.0000
	Posttest	2.9744*	0.6572	
Language	Pretest	4.2436*	0.9325	0.0000
	Posttest	5.2308*	0.8138	
Organization	Pretest	2.1282*	0.1936	0.0000
	Posttest	3.2949*	0.4700	
Mechanics	Pretest	1.2821*	0.7210	0.0017
	Posttest	1.7821*	0.1947	

*p value at 0.05

Table 3: Independent t-test for control and experimental group.

Variable		Mean	Variance	Significant value
Content	Control	6.2258	1.8473	0.2206
	Experimental	6.5385	0.5182	
Vocabulary	Control	2.7742	0.1306	0.2062
	Experimental	2.9744	0.6572	
Language	Control	4.7742*	0.9973	0.0488
	Experimental	5.2308*	0.8138	
Organization	Control	2.9677*	0.4156	0.0457
	Experimental	3.2949*	0.4700	
Mechanics	Control	1.5484	0.3226	0.0568
	Experimental	1.7821	0.1947	
*p value at 0.05				

Table 2 highlights the t-test results for two samples - the mean scores of the experimental group for pre-test and post-test of the experimental group. For the variable termed "content", it showed no significant difference at 0.4212 as this value was higher than 0.05. That means after the face-to face method of teaching for 5 weeks plus the intervention of ACMC, students were still having difficulties with their writing content. From these results, the researcher was able to infer that the students were still facing difficulties such as formulating thesis statement, pausing many times to think about what to write and facing trouble to focus on ideas. "Vocabulary", "Language" and "Organization" are significant at 0.0000 each. For vocabulary, students have shown improvements with word choice and usage of idioms. Students have also shown significant improvements in the language particularly their grammar. Furthermore, the experimental students had improved their writing organization. "Mechanics" is significant at 0.0017. Students have shown significant improvements in their punctuation and spelling of words. Referring to Table 2, it can be inferred that there were significant differences in mean scores between the pre-test and post-test in the experimental group for all variables except "content".

Table 3 highlights the t-test results for two samples, one being the post-test mean scores of the control group and the other being the post-test mean scores of the experimental group. Referring to these data, there was no significant difference in the post-test mean scores between the control group and the

experimental group for the variables "content", "vocabulary" and "mechanics". On the other hand, there were significant differences for the other two variables, namely "language" and "organization". Thus, the effects of using ACMC on Multimedia University ESL students can be detected in language and writing organization in this study.

Discussion:

The findings in this research supported the previous research (Huang, 2009; Yun-Jo An, 2006) of integrating ACMC into the teaching and learning of English language. In this research, the results of the independent t-test for the post-test of control and experimental group showed that ACMC did help to improve student's language and organization of their essay as the significant values were less than 0.05. Although there were only 2 out of 5 components in the writing rubrics that indicated significant differences, this gives an opportunity for other researchers to conduct research based on purposive sampling, targeting on students who are really poor in mastering the English language. With purposive sampling instead of random sampling, a better result could be obtained on the effectiveness of integrating ACMC in English writing.

Another notable finding from this study is the usage of computer technology in students' writing class. 54.84% of the students "somewhat agree" that they would like to use computer technology in their writing class. One of the factors is the factor of generation. These participants are generation-Y (Hoi, 2013) and spend an average of 4 to 5 hours daily on the usage of computer and Internet, and they are all Facebook users. From this study, 42.86% of the students spend an average of 4 hours daily on Facebook, and out of 70 participants, 64 of them are familiar with the settings on Facebook. The familiarity and popularity of Facebook as a social networking site is one of the reasons why Facebook is chosen as a tool of ACMC for the purpose of this research. Among the 3 students that were being interviewed, only one of them conveyed his dislike on the usage of technology in writing with the intention to avoid plagiarism.

"Honestly, I dislike the use of technology in writing. It makes me feel lazy. Also, I minimize the use of technology to avoid plagiarism." (Student C).

In addition, mixed responses were obtained from the 3 interviewees when they were asked if communicating with others by e-mail and the Internet has helped them to improve in their writing or improve in their attitude towards writing. Student A and C were of the same opinion that email and Internet has helped them. Student B explained that when he communicated with others by email or chatted on the net, he has the habit of using short-form words to express himself. For example, the word 'you', he spelled it as 'u', 'someone', he spelled it as 'sum1' or 'before', he spelled it as 'b4'.

These abbreviations have reduced student B's knowledge and vocabulary in English especially when he needed to compose in handwritten essay where he often forgot the spelling of certain words. Besides, student B totally disregarded the conventions of writing when he used technology to write in English. He composed his essay based on his expression of thoughts and disregarded the use of proper sentences and proper grammar. This has caused his writing skills to be weakened especially when it comes to grammar.

From student B's feedback, we are able to infer that he typed his conversations (texting) or correspondence by using abbreviations (shortened or contracted form of a word or phrase) that have always been an integral part of the computer culture and have since spawned a new language on the Internet together with the usage of Internet slang, acronyms and emoticons. Although student B found that this habit of his is a negative habit and should be avoided in writing in English, Crystal (2009) on the other hand finds that texting system of conveying sounds and concepts does help in children's literacy and this texting system goes back a long way to the very origins of writing. Thus, this raises a question: the new-born language on the Internet which is most talked about, what are the similarities and the differences compared to the very origins of writing? To answer this question, further research is needed.

Since it is inevitable to integrate technology in writing, this study has shed some light on the students' interest towards the teaching methodology in English language writing. The interviewees gave some suggestions on how teachers or lecturers of English language are able to integrate technology into writing.

"I would like more usage of technology especially on parts that need to be memorized. More useful techniques such as videos from *Youtube* on English." (Student A).

"Basically, I would like my teacher to use more graphical tools such as mindmap, cartoon, animation to make us [students] understand more and [I] tend to write more because writing is enjoyable." (Student B).

"I would like my teacher to post more interesting articles and more interesting videos related to writing skills. This is to avoid us from being bored with all the notes. (Student C).

At the same time, this research has caused the teachers or lecturers of English language to gain more insights from them to improve the methodology of teaching English writing.

Conclusion:

The results suggest that students' perception on the effects of ACMC in writing performance varies from positive to negative. They believe that they can compose short and simple English sentences, they have confidence in their writing in English and they

have confidence in writing in their first language. Interestingly, their perception also seems to reveal their fondness towards computer technology in writing class. This indicates that the likelihood of integrating computer technologies in writing classes will be well accepted by pre-university students. They feel comfortable revising writing in English, they have the motivation to learn writing in English in future, and they lack the problems in writing paragraphs in English.

However, the survey also revealed students' perception of the difficulties inherent in their attempts to write in English. Students stop many times to think about what to write when they are required to write in English, they face difficulties to adjust their way of writing from their native language writing to English thought pattern, and they have the anxiety in writing in English. They face difficulties in writing in closing sentences for their English paragraphs, they lack time to finish their English writing exams or assignments in the limited time period, and they have difficulties in summarizing a larger argument into a conclusion. Researchers who would like to improve their students' English writing should conduct such surveys on students' perception of English writing. This will allow researchers to focus on the issues that the students face when writing in English. It is recommended that surveys on perception should consist of open-ended questions to provide the researcher with an insight into students' hidden perception that is not found in survey close-ended questions. This is important given the different cultural background of students in a diverse population.

Based on this study, it is concluded that students who are taught English writing with the intervention of ACMC can achieve higher mean scores for all 5 different variables as compared to students who are not exposed or given an additional lessons on ACMC. This conclusion is made based on the higher mean scores for the variables of writing content, vocabulary, language, organization and mechanics as compared to the mean scores of the control group.

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