Web-Based Cognitive Writing Instruction (WeCWI): A Theoretical-and-Pedagogical e-Framework for Language Development

Boon Yih Mah

Abstract—Web-based Cognitive Writing Instruction (WeCWI)'s contribution towards language development can be divided into linguistic and non-linguistic perspectives. In linguistic perspective, WeCWI focuses on the literacy and language discoveries, while the cognitive and psychological discoveries are the hubs in non-linguistic perspective. In linguistic perspective, WeCWI draws attention to free reading and enterprises, which are supported by the language acquisition theories. Besides, the adoption of process genre approach as a hybrid guided writing approach fosters literacy development. Literacy and language developments are interconnected in the communication process; hence, WeCWI encourages meaningful discussion based on the interactionist theory that involves input, negotiation, output, and interactional feedback. Rooted in the e-learning interaction-based model, WeCWI promotes online discussion via synchronous and asynchronous communications, which allows interactions happened among the learners, instructor, and digital content. In non-linguistic perspective, WeCWI highlights on the contribution of reading, discussion, and writing towards cognitive development. Based on the inquiry models, learners' critical thinking is fostered during information exploration process through interaction and questioning. Lastly, to lower writing anxiety, WeCWI develops the instructional tool with supportive features to facilitate the writing process. To bring a positive user experience to the learner, WeCWI aims to create the instructional tool with different interface designs based on two different types of perceptual learning style.

Keywords—WeCWI, literacy discovery, language discovery, cognitive discovery, psychological discovery.

I. INTRODUCTION

WRITING is the hardest language skill for second language (L2) learners, which is also the most challenging skill to master for Malaysian undergraduates. Based on the nine L2 writing challenges caused by the system, instructor, and learner or "SIL" [1] as depicted in Fig. 1, a critical review has been done on the "learner" domain among the undergraduates from the Malaysia's largest university. Based on the performance analysis of an English course namely BEL422 Report Writing in two consecutive semesters (January-April 2011 and September 2011-January 2012) in

B. Y. Mah is a senior lecturer at Academy of Language Studies, UiTM, who is also a PhD candidate at Centre of Instructional Technology and Multimedia, USM. He is awarded a scholarship by the Malaysia's Ministry of Education to pursue his doctoral study in the field of e-learning (language development through technology). Web-based Cognitive Writing Instruction (WeCWI) is originated from his PhD research framework. He is attached with Universiti Teknologi MARA (Pulau Pinang), Jalan Permatang Pauh, 13500 Bukit Mertajam, Pulau Pinang, Malaysia (phone: +604-3823441; e-mail: mahboonyih@gmail.com).

terms of the course assessment components, report assessment items, language and content assessment items and their weightings, civil and electrical engineering undergraduates were found weak in writing in several aspects. These include complexity of writing skill and scarcities in literacy skills, language proficiency, critical thinking, and information literacy, interlanguage errors, and L2 writing anxiety [2]. These problems will lead them to unemployment after graduation due to poor command of English. Therefore, based on the needs analysis among the learners and instructors, there is a high demand for developing a supplementary web-based instruction (WBI) [3]–[5].
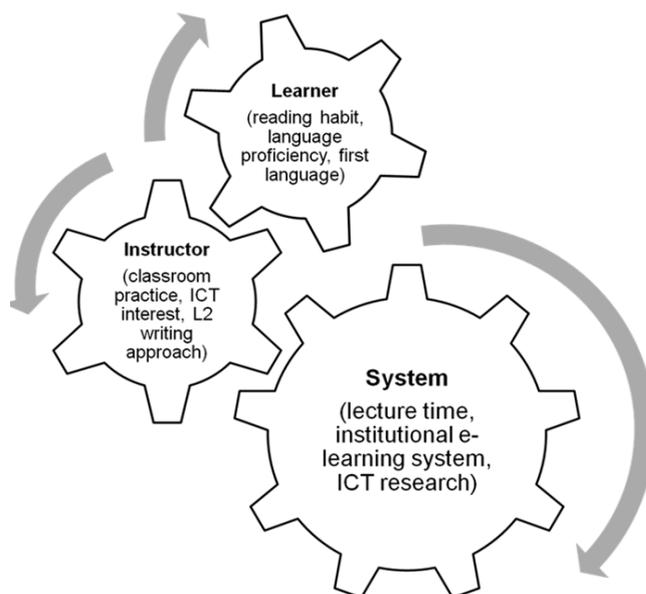

Fig. 1 SIL: System (S), Instructor (I), and Learner (L) [1]

Writing is a common classroom activity in secondary schools and higher learning institutions, which can take many forms and are found across all subjects in the curriculum [6]. Besides serving as teaching purpose, writing in English as a Second Language (ESL) classroom is also a means for assessment: Reviewing, reorganising, and reflecting upon what have been taught and learnt. Writing consolidates language, records what has been learnt orally, makes learning more realistic, and provides convenient and useful means for language testing [7]. Nonetheless, L2 writing instruction is an area that has been commonly underrepresented since only a

World Academy of Science, Engineering and Technology
International Journal of Information and Communication Engineering
Vol:9, No:2, 2015

few studies direct their main focus to the discussion of instructional matters [8]. Due to the awareness of Internet infusion in language classrooms, some writing instructors from different countries have been incorporating WBI as a hypermedia-based instructional programme [9] into the language courses [10].

II. WeCWI: The Language Development

Web-based Cognitive Writing Instruction (WeCWI) as shown in Fig. 2 is a hybrid e-framework employed to develop a WBI, which contributes towards instructional design and language development [2]. The contribution towards language development can be divided into linguistic and non-linguistic perspectives. In linguistic perspective, WeCWI emphasises on the literacy and language discoveries, while the cognitive and psychological discoveries are the focal points in non-linguistic perspective. WeCWI provides a remedy of poor writing skill faced by the L2 learners in higher education by integrating four main theoretical rationales—language acquisition, composition studies, cognitive theories, and e-learning—towards literacy, language, cognitive, and psychological developments.

Fig. 3 WeCWI appears as a molecule with five atoms and each atom contains a different structure of nucleus

Fig. 2 The official logo of Web-based Cognitive Writing Instruction (WeCWI)

WeCWI is illustrated in Fig. 3 as a molecule with five atoms; each atom contains a different structure of nucleus. WeCWI is highly supportive in literacy (L_2), language (L_3), cognitive (C_4), and psychological (P_4) developments depicted as the four connected atoms. L_2 and L_3 are mutually inclusive while L_3 and C_4 are linked due to sharing the same contributing factors. Fig. 4 shows the four main theoretical rationales—language acquisition (L_1), composition studies (C_1), cognitive theories (C_2), and e-learning (E_1)—are seamlessly integrated as the core of WeCWI, which can be summarised into an equation as: (Language Acquisition + Composition Studies + Cognitive Theories) E-learning = WeCWI.
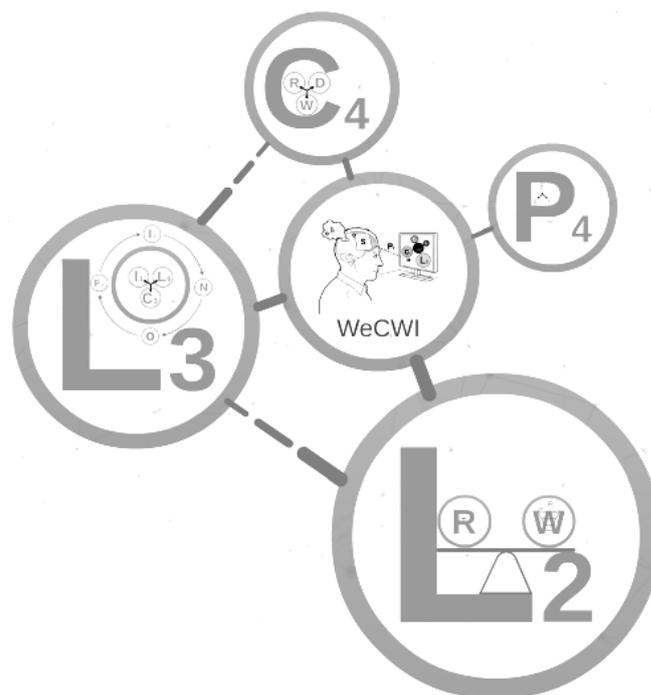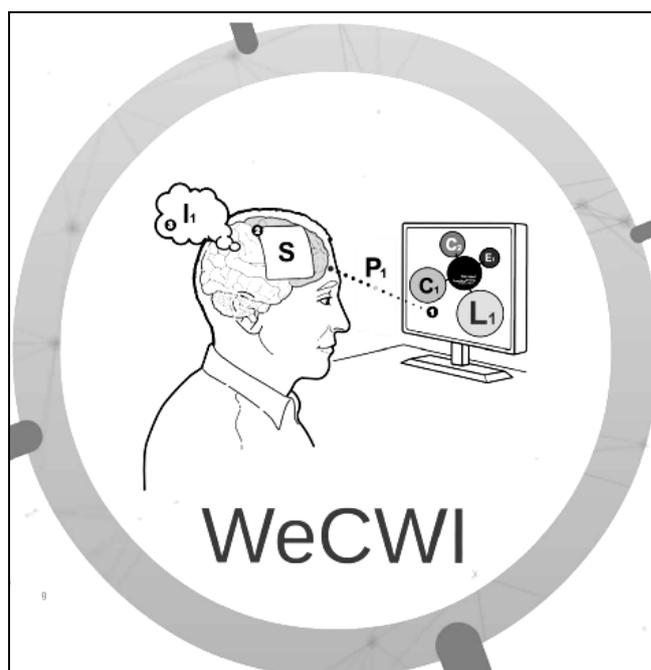

Fig. 4 The core of WeCWI that consists of language acquisition (L_1), composition studies (C_1), cognitive theories (C_2), and e-learning (E_1)

A. Linguistic Perspective: Literacy Discovery

The acquisition-learning hypothesis, input hypothesis, and reading hypothesis proposed by [11] are adopted in WeCWI to enhance literacy skills through *free reading* (F_1) and *enterprises* (E_1) in which these are the two different channels used to engage reading (R) as shown in Fig. 5. By selecting and making the reading materials more accessible online,

World Academy of Science, Engineering and Technology
International Journal of Information and Communication Engineering
Vol:9, No:2, 2015

WeCWI encourages learners to take part in free reading—read for pleasure on a voluntary basis. In addition, more comprehensible input can be learnt through enterprise—a formal English language instruction delivered via WBI assisted with web widgets or hypertext. The increase of comprehensible inputs through free reading and enterprises supports language acquisition, which will lead to literacy development.

Moreover, the practice of a guided writing approach helps to create, elucidate, and expand the abstract ideas, which supports literacy development. As depicted in Fig. 5, writing (W) is also engaged by enterprises (E_1) guided by a combination of product (P_2), process (P_3), and genre (G) approaches called process genre (P_3G) approach [12]. Process genre approach comes with six recursive writing stages [13], which focuses on the relationship between the purpose and the form for its genre. The learners are guided to prepare, model and reinforce, plan, joint construct, independent construct, and revise their writing in a step-by-step manner. By employing the specific web widgets or hypertext on the instructional tool for pedagogical purposes, WeCWI lead the learners towards a better writing skill.
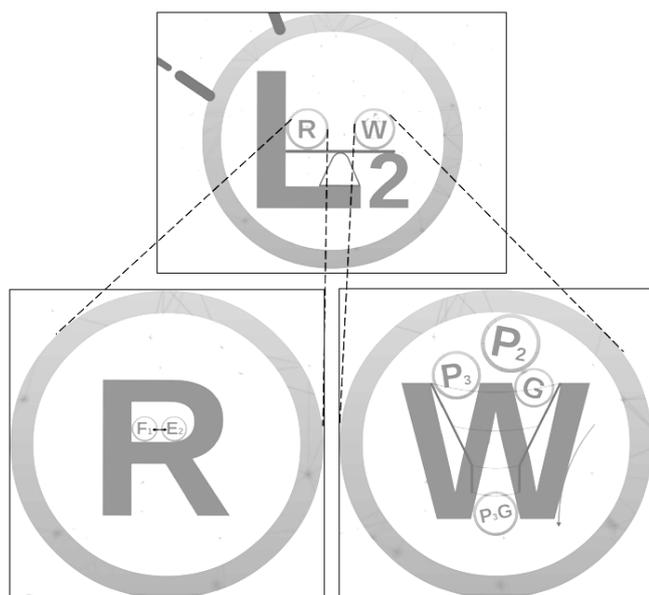

Fig. 5 Literacy (L_2) development involves *free reading* (F_1), e*nterprises* (E_1) in reading (R) as well as the combination of product (P_2), process (P_3), and genre (G) approaches or process genre (P_3G) approach in writing (W)

B. Linguistic Perspective: Language Discovery

Literacy and language developments are interconnected, particularly when it comes to communication. Thus, WeCWI sets up an online discussion application via web widgets and hypertext on the instructional tool, which supports interactionism in second language acquisition (SLA). As illustrated in Fig. 6, the conversational patterns including input (I_2), output (O), and interactional feedback (F_2) emphasise the correctness of meaning, form, and function [14]. Negotiation (N) of meaning happens in discussion, which involves

clarification of ideas and correction of meaning within a meaningful conversation. Thus, language outputs with higher accuracy in spelling, vocabulary, and grammar are achieved.

Supported by the interaction-based model of e-learning [15] as shown in Fig. 6, WeCWI supports language (L_3) development during the interaction process among the instructor (I_3), the learner (L_4), and the content (C_3). WeCWI builds a rich SLA environment for learners to collaborate with their peers and interact with their instructor, peers, and digital content independently. Through online discussion via the instructional tool, inquiries and feedback are transmitted synchronously and asynchronously via computer-mediated communication (CMC) between the instructor and learners and among learners. Throughout the meaningful interactions involving different parties, English can be acquired during the subconscious process and learned in a conscious manner.
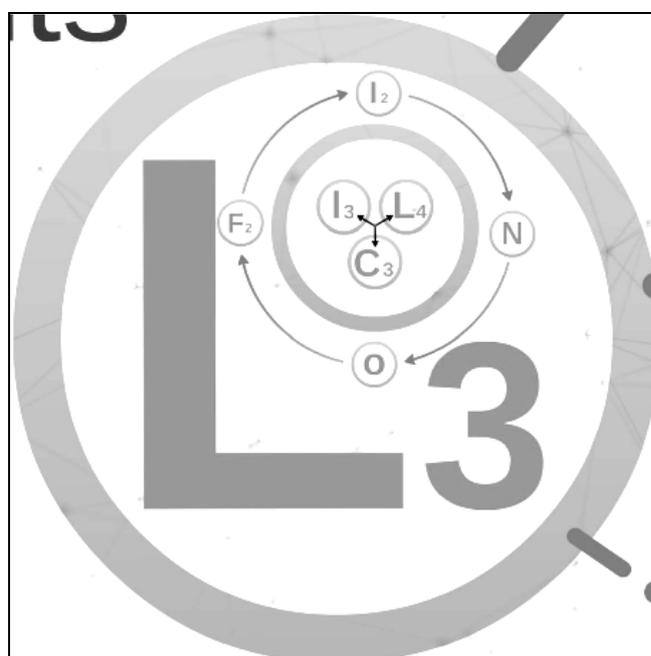

Fig. 6 Language (L_3) development involves the interaction process among the instructor (I_3), the learner (L_4), and the content (C_3) through input (I_2), negotiation (N) of meaning, output (O), and interactional feedback (F_2)

C. Non-linguistic Perspective: Cognitive Discovery

WeCWI draws attention to the contribution of reading (R), discussion (D), and writing (W) towards cognitive (C_4) development [11] as depicted in Fig. 7. Reading helps learners generate ideas, make inferences, draw conclusions, and solve the problems eventually. In addition, writing also helps produce, consolidate, elucidate, and sharpen ideas, which facilitates the learners to become critical thinkers. Furthermore, negotiation of meanings, interactional feedback, and clarification of thoughts take place during discussion, which stimulates learners to explore further. When they draw conclusions and finally resolve the problems, these processes would have led them to develop critical thinking.

Additionally, WeCWI emphasises on information

World Academy of Science, Engineering and Technology
International Journal of Information and Communication Engineering
Vol:9, No:2, 2015

exploration through interaction and questioning based on inquiry models [16], [17]. The processes of searching, downloading, and streaming results will turn the information into a small pool of data. By interacting, analysing, and evaluating the digital contents, the questions posted in the instructional tasks engage learners to consume and analyse the information critically. The inquiries derived from their existing knowledge branches out through reading and writing. The relationships of the ideas can be visualised through reading when the answers are written. This will engage the learners to think critically in problem solving.
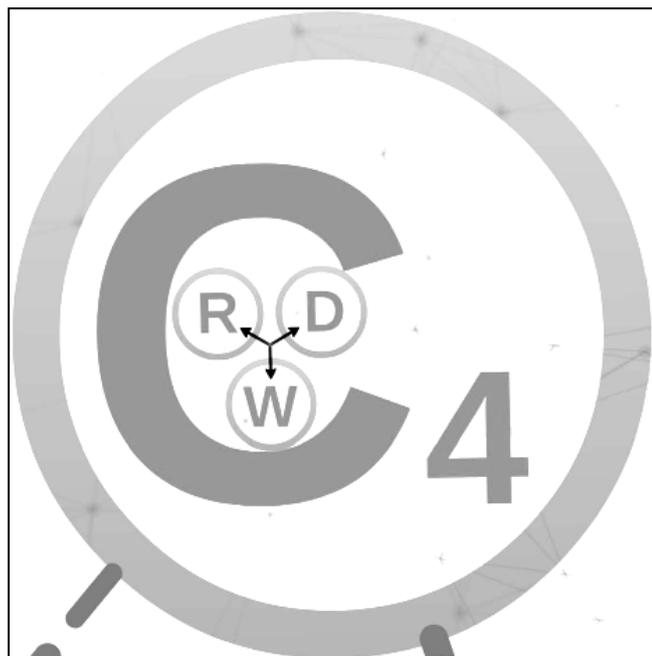

Fig. 7 Cognitive (C_4) development involves reading (R), discussion (D), and writing (W)

D. Non-linguistic Perspective: Psychological Discovery

Online resources in the forms of web widgets and hypertext are embedded on the instructional tool in support of the achievement of different writing stages based on the process genre approach. The web widgets and hypertext are also served for scaffolding purpose to facilitate the learners to accomplish the writing tasks from preparation stage till revision stage. This step-by-step guided approach does not only achieve more positive writing attitude, but also reduce their writing anxiety. For instance, online dictionary, language translator, and grammar checker are helpful for L2 learners who have low language proficiency.

Furthermore, WeCWI develops the instructional tools with two different interface designs, widgetised and non-widgetised, in order to bring a positive user experience for the learners. To ensure the L2 learners acquire and learn a language better based on their preference and strengths, knowing their learning styles is essential [18]. Hence, as illustrated in Fig. 8, WeCWI employs two different designs of user interface (widgetised and non-widgetised) based on the information the learners preferentially perceive (P_1) through

their senses (S) or intuition (I_1) that promotes psychological (P_4) development. If there is an ideal match between the instructional user interface and their learning styles (sensing or intuitive), learners could be more engaged throughout the learning process to boost up the learners' writing performance and critical thinking.

Fig. 8 Psychological (P_4) development involves learners' preferentially perceive (P_1) information through their senses (S) or intuition (I_1)

III. CONCLUSION

WeCWI offers a set of theoretical-and-pedagogical principles in language acquisition, cognitive theories, composition studies, and e-learning to transform an educator into an aggregator, curator, publisher, social networker and ultimately, a web-based instructor [2], who are capable in designing, developing, modifying, and improving the instructional systems, tools, and interfaces. Besides the instructors, WeCWI also benefits the second language learners' particularly Malaysian undergraduates who are weak in writing skill. To support the culture of knowledge sharing in language development through technology, WeCWI conducts both course and training series and further details can be accessed at http://wecwi.blogspot.com/p/enterprises.html [2]. Besides, WeCWI also appears on other social media platforms such as Facebook, Twitter, Google+, Pinterest, Blogger, and Yapp as follows:

1) WeCWI Page: www.facebook.com/WebbasedCognitive WritingInstruction
2) WeCWI Tweet: twitter.com/mahboonyih
3) WeCWI Plus: plus.google.com/u/0/+BoonYihMah
4) WeCWI Board: pinterest.com/mahboonyih/web-based-cognitive-writing-instruction
5) WeCWI Blog: wecwi.blogspot.com
6) WeCWI App: my.yapp.us/MTGGZS

World Academy of Science, Engineering and Technology
International Journal of Information and Communication Engineering
Vol:9, No:2, 2015

REFERENCES

[1] B. Y. Mah, Irfan Naufal Umar, and V. F. Thomas Chow, "L2 writing challenges for the undergraduates: A performance analysis and a literature review on SIL domains," in *The Asian Conference on Language Learning Conference Proceedings 2013*, 2013, pp. 302–316.

[2] B. Y. Mah, "Web-Based Cognitive Writing Instruction (WeCWI): A Hybrid e-Framework for Instructional Design," *Int. J. Soc. Manag. Econ. Bus. Eng.*, vol. 8, pp. 3436–3440 EM –, Jan. 2014.

[3] Noriah Ismail, Saadiyah Darus, and Supyan Hussin, "ESL tertiary students' writing needs: A framework for a supplementary online writing program," *AJTLHE*, vol. 4, no. 2, pp. 61–78, 2012.

[4] Noriah Ismail, Supyan Hussin, and Saadiyah Darus, "ESL tertiary students' writing problems and needs: Suggested elements for an additional online writing program (IQ-Write) for the BEL 311 Course," *Int. J. Learn.*, vol. 18, no. 9, pp. 69–80, 2012.

[5] Noriah Ismail, Supyan Hussin, and Saadiyah Darus, "ESL students' attitude, learning problems, and needs for online writing," *GEMA Online^{TM} J. Lang. Stud.*, vol. 2, no. 4, p. 1089, 2012.

[6] C. C. M. Goh and R. E. Silver, *Language acquisition and development: A teacher guide*. Singapore: Pearson Education South Asia, 2004, p. 166.

[7] Nesamalar Chitravelu, Saratha Sithamparam, and S. C. Teh, *ELT methodology: Principles and practice*. Selangor: Penerbit Fajar Bakti Sdn.Bhd., 2005.

[8] J. Zhang, "A comprehensive review of studies on second language writing," *HKBU Pap. Appl. Lang. Stud.*, vol. 12, 2008.

[9] B. H. Khan, *Web-based instruction*. United States: Educational Technology, 1997.

[10] Y. C. J. Chao and C. K. Huang, "The effectiveness of computer-mediated communication on enhancing writing process and writing outcomes: The implementation of blog and wiki in the EFL writing class in Taiwan," in *World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007*, 2007, pp. 3463–3468.

[11] S. Krashen, *Fundamentals of language education*. New Jersey: Laredo Publishing, 1992.

[12] R. Badger and G. White, "A process genre approach to teaching writing," *ELT J.*, vol. 54, no. 2, pp. 153–160, 2000.

[13] G. Yan, "A process genre model for teaching writing," *English Teach. Forum*, vol. 43, no. 3, pp. 18–27, 2005.

[14] P. F. Kwah, "Teaching writing: A look at purpose, writing tasks, and implications," *English Educ.*, vol. XXXIII, 1999.

[15] T. Anderson, "Getting the mix right again: An updated and theoretical rationale for interaction," *Int. Rev. Res. Open Distance Learn.*, vol. 4, no. 2, 2003.

[16] B. C. Bruce and J. Davidson, "An inquiry model for literacy across the curriculum," *J. Curric. Stud.*, vol. 28, no. 3, pp. 281–300, 1996.

[17] D. R. Garrison, T. Anderson, and W. Archer, "Critical inquiry in a text-based environment: Computer conferencing in higher education," *Internet High. Educ.*, vol. 2, no. 2–3, pp. 87–105, 2000.

[18] Rozhan M. Idrus, "Transforming engineering learning via technogogy," in *5th WSEAS/IASME International Conference on Engineering Education*, 2008.