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Learning how to write effectively for academic journals: A case study investigating the design and development of a genre-based writing tutorial system

Hsiang-Yee Lo [a, b], Gi-Zen Liu [a, b, *], Tzone-I Wang [c]

[a] Department of Foreign Languages & Literature, National Cheng Kung University, 1, University Road, Tainan City 701, Taiwan
[b] Foreign Language Center, National Cheng Kung University, 1, University Road, Tainan City 701, Taiwan
[c] Department of Engineering Science, National Cheng Kung University, 1, University Road, Tainan City 701, Taiwan

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ABSTRACT

Genre-based writing instruction (GBWI) has been used for English journal paper writing both in classroom teaching and in the development of materials utilizing move analysis and corpus-based analysis. Some writing systems and tutorials have also been developed to improve the writing of non-native English speakers (NNES), as well as to assist academics and researchers for their publications. However, most of these systems had been developed for certain aspects of academic journal writing, such as organizing references, preventing plagiarism, or finding appropriate collocations. Accordingly, *EJP-Write*, a Chinese-interfaced writing system for English academic journal writing, was developed based on GBWI to teach and assist journal writing in a user-friendly environment.

The present study aimed to investigate the perceived usefulness (content effectiveness) and perceived usability (system functionality) of *EJP-Write*, and identify other factors that might influence user attitudes and continued usage intention. Data was collected via questionnaire ($N = 35$) and structural equation modeling (SEM) was conducted for fitness estimation on the modified Technology Acceptance Model (TAM). Semi-structured interviews were also conducted to collect additional information for usefulness and usability evaluation ($N = 14$). Regarding perceived usefulness, the results show that participants felt the *EJP-Write* content was useful and effective in teaching genre and move structure because of the aid of various forms of support and examples such as phrase and paragraph templates. Additionally, the learning materials for verb tenses and citation formats were informative and practical for the participants to avoid grammatical and technical errors. However, the move structure provided was limited to the discipline of e-learning and education; thus, move analysis for different fields was suggested. Regarding perceived usability, the citation-related features in *EJP-Write* were particularly well-regarded. Participants also provided suggestions to improve online editing and outline developing features in the system. Factors found to influence user attitudes, and thus the intention of continued use, were usefulness and usability, while writing anxiety and personalization had less impact.

Findings of the quantitative and qualitative data analysis in the study suggest that *EJP-Write* can play multiple roles inside or outside of the classroom, both as a platform integrating most features essential for journal paper writing, and as a teacher providing guidance and learning materials necessary for this specific genre. It is anticipated that this study will contribute to the knowledge base about both content and interface design for journal paper writing in the discipline of e-learning and education. For program designers of web-based writing tutorials, the involvement of users in the development of move structure could both strengthen various GBWI approaches and solve issues related to disciplinary differences.

* Corresponding author. Department of Foreign Languages & Literature, National Cheng Kung University, 1, University Road, Tainan City 701, Taiwan. Tel.: +886 952 179024; fax: +886 6 2387730.
E-mail addresses: hyl.ncku@gmail.com (H.-Y. Lo), gizen@mail.ncku.edu.tw, gizenliu@gmail.com (G.-Z. Liu), wti535@mail.ncku.edu.tw (T.-I. Wang).

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1. Introduction

It is well known that research publications help gain access to degrees, job offers and administrative roles in various capacities; in short, "we are what we write" (Hyland, 2013, p. 53). Further, internationally indexed publications are now a common graduate student requirement, which has led to various forms of writing training to improve journal writing skills. Collaborative Interdisciplinary Publication Skills Education (CIPSE, Cargill, O'Connor, & Li, 2012) is one such method and includes three components: genre analysis, gatekeeper awareness, and story development. However, CIPSE requires institutional support for both language and content/subject experts to form successful collaborations and benefit writers.

Regarding integrating technology into curriculum design, Web-based instruction (WBI) and computer-assisted language learning (CALL) have become part and parcel of ESL/EFL pedagogy (Chen, Shih, & Liu, 2013; Chiu & Liu, 2013; Liu, Hwang, Kuo, & Lee, 2014; Liu, Liu, & Hwang, 2011). Hence, software and corpus-based approaches to helping improve both writing skills and the chances of publication have been developed (Carrió-Pastor, 2013; Cortes, 2013; Hyland, 2009; Hyland & Tse, 2009; Loncar, Barrett, & Liu, 2014; Relles & Tierney, 2013; Zheng, Warsschauer, & Farkas, 2013). However, most writing systems are not specifically designed for the needs of English learners regarding academic journal paper writing and publication. In response to this shortcoming, *EJP-Write*, a Chinese-interfaced writing system for *E*nglish academic *J*ournal *P*aper *W*riting, was thus developed to empower native-Chinese writers with the knowledge and writing skills needed for this genre of writing.

The present study investigated the perceived usefulness (content effectiveness) and usability (interface and feature functionality) of, as well as user attitude toward and future intention to use *EJP-Write* via a modified Technology Acceptance Model (TAM), drawing upon a range of qualitative and quantitative data. It is anticipated that the results may help improve not only software design for academic writing, but also online writing and e-learning pedagogies.

1.1. Elements for the establishment of a successful writing system

Differing from traditional writing courses where in-class lectures and feedback from the instructor are the key components of learning, a self-directed online writing system can play various roles to meet user needs for academic writing. These roles include acting as an instructor to provide writing guidance and learning materials, offering a user-friendly writing environment (Waes, Weijen, & Leijten, 2014), and helping to organize references for academic writing. The following subsections introduce the key elements related to designing a writing system, namely the various approaches of existing writing instructions and systems.

1.1.1. Pedagogical approaches to English writing instruction

Academic Literacies (AcLits) in the UK higher education system emphasizes literacy practices that aim to raise critical awareness of power relations, writer identity and agency (Lea & Street, 2006; Wingate, 2012). However, research has suggested that students might not be as ready as expected to explicate and criticize their work with regard to disciplinary writing conventions (Deane & O'Neill, 2011; Wingate, 2012). Novice writers might be disoriented when they are unfamiliar with the genre but asked to "own" it and to challenge the power relations or find writer identity. Rather, only when the students develop an understanding toward their own disciplinary conventions can the writing practices be challenged and the writer find his/her own voice and identity.

Writing in Disciplines (WiD) has long been applied in the U.S. education system, where subject teachers are responsible for teaching writing (Wingate, 2012). Students in WiD training learn about the writing formats and styles of a given discipline, and learn to meet specific writing criteria (Deane & O'Neill, 2011). The advantages of WiD are that it includes students from all disciplines, provides discipline-specific discourses and conventions from experts (i.e., subject teachers), and is able to clearly explain disciplinary writing criteria to avoid misunderstandings (Wingate, 2011). Nevertheless, constraints such as heavy workloads and a lack of resources may render subject teachers reluctant to teach writing in this manner (Bailey, 2010).

Genre-based writing instruction (GBWI) includes a number of different branches regarding both theory and practice (Bawarshi & Reiff, 2010; Bazerman, Bonini, & Figueiredo, 2009; Englander, 2014; Johns, 2011); examples of which are the English for Specific Purposes (ESP) movement with "moves analysis" (Johns, 2008; Swales, 1990), the Sydney School (Hyon, 1996) and New Rhetoric School (Bawarshi & Reiff, 2010). These approaches consider different genres with specific communicative purposes; thus, the emphasis is on analyzing texts in contexts. Therefore, it differs from WiD in that GBWI distinguishes different genres (e.g. essays, term papers, lab reports, grant proposals, thesis, journal articles) and analyzes the text to form teaching materials and learning opportunities. For instance, employing Swales' move analysis, researchers analyze numerous texts of a specific genre to identify rhetorical sequences, or *moves*, in different parts of the writing. Students then learn about these moves to meet their disciplinary writing conventions and criteria. In the Sydney School approach, however, both the teacher and students conduct text analysis jointly and individually to develop the contextual linguistic features best suited for their social functions (Wingate, 2012). Lastly, adapting Activity Theory (Russell, 1995, 1997), the New Rhetorical approach focuses on genre awareness in the writing classroom by analyzing the immediate context, the situation, the writer, the reader, their interaction and ideology, and factors relevant to the setting to accomplish the writing task (Johns, 2008; Russell, 1997). Among these GBWI approaches, Swales' moves analysis in ESP and the Sydney School have been applied more commonly in ESL/EFL settings, enabling leaning materials to be more scaffolded for novice writers (Johns, 2008).

1.1.2. Genre and move structures for the instruction of journal article writing

GBWI can be used to help identify genre and move structures for different sections of research papers, as well as the linguistic features and rhetorical functions that can benefit learners and improve their writing skills (Feak & Swales, 2009; Hyland, 2009; Johns, 2008, 2011, 2012; Johns et al., 2006; Khodabandeh, Jafarigohar, Soleimani, & Hemmati, 2013; Martín & León Pérez, 2014; Samraj, 2013; Samraj & Monk, 2008; Swales & Feak, 2009; Swales, 2011). Empirical research examining GBWI has reported positive outcomes that suggest the explicit teaching of genre, move structure and linguistic features and forms can be very beneficial for learners (Chang & Kuo, 2011; Cheng, 2006, 2007a, 2007b; Costino & Hyon, 2011; Driscoll & Aquilina, 2011; Henry, 2007; Johns et al., 2006; Khodabandeh et al., 2013; Kuteeva, 2013; Negretti & Kuteeva, 2011; Samraj & Monk, 2008; Stoller & Robinson, 2013; Wingate, 2012).

Nevertheless, the question remains to what extent can technology help learners and writers of English successfully write and publish their work? To what degree does writing software help teachers deliver the necessary knowledge and skills for academic journal writing? Can it replace them? Could a well-developed writing system incorporate multiple teaching roles to effectively deliver both top-down teaching (e.g. genre and move structures; please refer Cargill, 2011; Cava, 2011; Feak & Swales, 2009; Flowerdew, 2009; Martín & León Pérez, 2014; Mur-Dueñas, 2011; Samraj, 2013; Suntara & Usaha, 2013; Supatranont, 2012; Swales & Feak, 2009) and bottom-up materials (e.g. lexical bundles and linguistic forms; please see Biber, 2004; Carrió-Pastor, 2013; Cortes, 2013; Hyland & Tse, 2009; Hyland, 2009), while also helping users write with less effort? Perhaps one way to develop a better system is for more collaboration among researchers, educators, material developers and program designers to evaluate the approach that appears to work best – which might entail an integration of genre-based approaches and CALL (Arnó–Macià, 2012; Chapelle, 2009; Swales, 2011). Swales (2011) stated that different genre traditions can and have been coalesced to develop better pedagogical practices; consequently, it is possible that the integration of GBWI and CALL could herald a new era for the teaching of academic writing online.

1.2. Software and systems for journal paper writing

The following section introduces a selection of current systems related to academic writing that promote either writing efficacy, plagiarism prevention, or NNES writing assistance, but do not integrate these three services.

1.2.1. Collecting and sorting references: EndNote, Zotero, and Readcube

EndNote (Endnote.com, 2014) is a very popular software package to search for and organize annotated citations. Users can synchronize their EndNote library and access collected studies. Further, the software can be embedded in MS Word, making citing sources and related searches more convenient. *Zotero* (Zotero.org, 2014) automatically collects source details (e.g. author, year, title, publisher) and download references that are then stored online or offline in various formats, such as PDF, docx, or ppt, and webpage snapshots with auto-saved URL links. Users of *Zotero* can also insert references and a bibliography into MS Word documents seamlessly. Lastly, *ReadCube* (Readcube.com, 2014) provides enhanced PDF features and highlighting functions that enable its users to search for relevant references from PubMed and Google Scholar within the program.

1.2.2. Writing practices and plagiarism prevention: Criterion, MyAccess, WriteCheck, QBook, Turnitin, and DWright

Many writing teachers utilize *Criterion*, *MyAccess* and *WriteCheck* to improve English essay writing skills (Liu, Lo, & Wang, 2013a). Although these programs were not specifically developed for academic writing, certain features can act as writing instruction to improve paragraph organization. *QBook* (Qbook.org, 2014) offers a self-directed writing interface that guides users in writing research papers. Nevertheless, plagiarism avoidance is not taught or explained in the above writing systems; consequently, writers might require a plagiarism detector, such as *Turnitin*, or patchwriting detector, like *DWright*, to ensure proper compliance with publishing practices. Coupled with the plagiarism detection, is assistance with regard to paraphrasing and citation practice, which can provide training for novice writers (Liu, Lo, et al., 2013).

1.2.3. Collocation: Collocation Checker, Linggle, COCA, NTNU Web Concordancer, and VLC Web Concordancer

Collocation Checker (NTHU NLPlab, 2010) can provide users with various verb-noun collocations, along with related variations and examples. Similarly, *Linggle* (Linggle.com, 2014) can generate the most frequent collocations and examples after a user inputs a keyword with a given form (e.g. noun, adjective, verb and preposition). The *Corpus of Contemporary American English* (COCA) (Corpus.byu.edu/coca, 2014) constitutes the largest corpus of American English. This website covers many genres and enables users to search for words or phrases, and then displays a list of surrounding words, phrases, or parts of speech, among others, based on frequency or one of the many other available. The NTNU Web Concordancer contains a relatively simple interface with Chinese and English instructions to search for collocations, while the VLC Web Concordancer further provides synonym checking and other services, such as reading practice and study guides.

2. The content and features of *EJP-Write*

The content of *EJP-Write* was developed based on GBWI, and more specifically, according to genre and move analysis (Swales, 1990), in the hope of addressing the shortcomings related to AcLits and supplementing subject teachers and experts in WiD and in CIPSE. Regarding functionality, *EJP-Write* developers took into consideration the strengths of the aforementioned programs and pedagogies, aiming to develop an all-in-one system to augment or replace traditional lectures with an online learning and writing environment. The development of *EJP-Write* was under the supervision of two professors from the Department of Engineering Science and the Department of Foreign Languages & Literature with many years of experience teaching programming, interface design and English writing. Moreover, the content and learning materials were based on genre analysis conducted by the researchers. The materials, such as the moves, sentence/paragraph patterns and examples, were analyzed, developed, evaluated and supervised by two EFL instructors. Therefore, the design and the development of EJP-Write could reflect to a certain degree the decision-making and perceptions of program designers and disciplinary professors. Table 1 below presents a list of systems and functions for comparison with the features developed in EJP-Write. In addition, the flowchart in Appendix A illustrates the design and development process of EJP-Write.

Fig. 1 illustrates the architecture of the user–system interaction in which modules of EJP-Write are marked in orange, server databases in blue and outcomes in green.

The modules in Fig. 1 help guide and assist users to learn and achieve different tasks related to academic writing, with various databases and materials for support. Writing outcomes such as outlines or actual writing text are considered the products of online learning and writing assisted by the system.

Table 1
List of systems and functions in comparison with the features developed in EJP-Write.

Major function								
I. Collecting & sorting references		Citation plug-in for MS Word	Cloud syncing	Automatic organization oi paper	Note taking	Easy import of existing library	Folder organization	Cost
1	EndNote	✓	✓	✓	✓	✓	✓	US $249.95
2	Zotcro	✓	✓	✓	✓	✗	✓	Free
3	Rcadcube	✗	✗	✗	✓	✗	✓	Free
4	EJP-Write	[a]	✓	✓	✓	✓	✓	US $15/per year

II. Writing practices and plagiarism prevention		Genre-based writing instruction (GBWI)	Linguistic patterns and examples for journal writing	Instruction on organization or outline developer	Grading and feedback on writing from the software	Paraphrasing practice	Instruction on citation	Plagiarism detection
1	Criterion	✗	✗	✓	✓	✗	✗	✗
2	MyAccess	✗	✗	✓	✓	✗	✗	✗
3	WriteCheck	✗	✗	✗	✓	✗	✗	✓
4	QBook	✓	✓	✓	✗	✗	✗	✗
5	Xunulia	✗	✗	✗	✗	✗	✗	✓
6	BMfibl	✗	✗	✗	✓	✓	✓	✓
7	EJP-Write	✓	✓	✓	*X*	[b]	✓	[b]

III. Collocation		Collocation of *various* forms (e.g. noun, verb, adjective or adverb)	Chinese translation	Example sentences	Synonyms	Easy search	Simple interface	Chinese interface
1	Collocation Checker	✗	✗	✓	✗	✓	✓	✗
2	Linggle	✓	✗	✓	✗	✓	✓	✗
3	COCA	✓	✗	✓	✓	[c]	[c]	✗
4	NTNU Web Concordancer	✓	✗	✓	✗	✓	✓	✓
5	VLC Web Concordanccr	✓	✗	✓	✓	✓	✓	✗
6	EJP-Write	✓	✓	✗	✗	✓	✓	✓

[a] As an online writing platform, EJP-Write allows insertion of references into text, and then users can easily export the manuscript into a .docx file.
[b] EJP-Write provides a link to DWright and can be purchased as a package for academic writing, paraphrasing and citation practice, as well as patchwriting detection.
[c] The interface and search function of COCA is relatively complicated due to its specification for search results.

2.1. EJP-Write *was designed for academic writing*

The content and features of *EJP-Write* are elaborated in the following (Fig. 2): (1) "My Papers (我的論文)" for outline development, writing and editing research papers, checking moves structures and templates, citing references, and inserting figures; (2) "References and Notes (文獻整理與筆記)" for uploading references, editing notes, and importing EndNote references; and, (3) "Organization, Verb tenses and APA Citation Style (論文寫作架構與格式說明)" for instructions on moves structures, tenses and APA citation formats.

2.1.1. *"My Paper" (Academic paper writing module)*

With the "My Paper" feature, users can set a working title for their paper, as well as the background of the author(s), the target journal and the link to its website, word limitation, impact factor, notes and references. Next, they can develop an outline and start writing with the

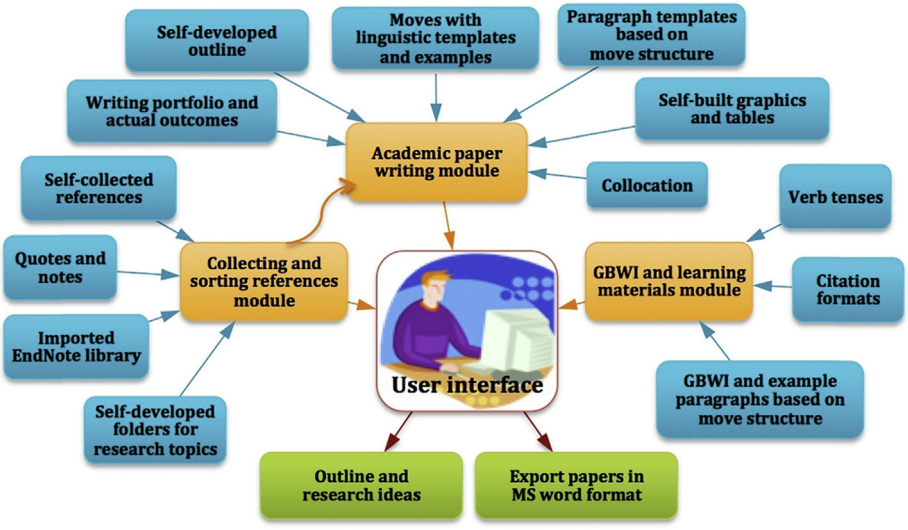

Fig. 1. Architecture of EJP-Write user–system interaction regarding journal paper writing with the three modules marked in orange and databases marked in blue. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Fig. 2. *EJP-Write* Homepage with an overview of the system's features.

help of the *Tools* feature (see Fig. 3). Users can enlarge the *Outline* panel for a bigger view (see Fig. 4), while the *Writing Area* can also be expanded to full-screen view and has functions comparable to those in MS Word.

Five features are included in *Tools*: (1) citing references; (2) checking rhetorical moves and phrase templates; (3) checking paragraph templates; (4) checking collocations; and, (5) inserting figures. Users can drag references from "References and Notes" into the *Writing Area*, including quotes, notes, author names and publication years (see Fig. 5). This also helps prevent plagiarism because it deters writers from combining material from the references with their own notes and presenting someone else's words or ideas as their own.

For instance, by clicking on a given chapter, such as *Introduction* or *Discussion*, to select a rhetorical move, users can choose from many phrase templates for that particular move (see Fig. 6). Using drop-down lists for the different chapters in a paper, users can review all moves without missing any of the rhetorical steps needed. The paragraph templates are also based on such moves, but on a larger scale.

2.1.2. *"References and Notes" (Collecting and sorting references module)*

In "References and Notes", users first develop different research topics to better classify the references. Then PDF files can be uploaded, and details of references, quotes and notes added. Referencing information developed in "References and Notes" can be inserted in the text when writing in "My Paper" and the references list will be included in the exported docx file. In *EJP-Write*, references are listed in APA citation style, and can be imported from *EndNote*; thus, users do not need to collect references a second time.

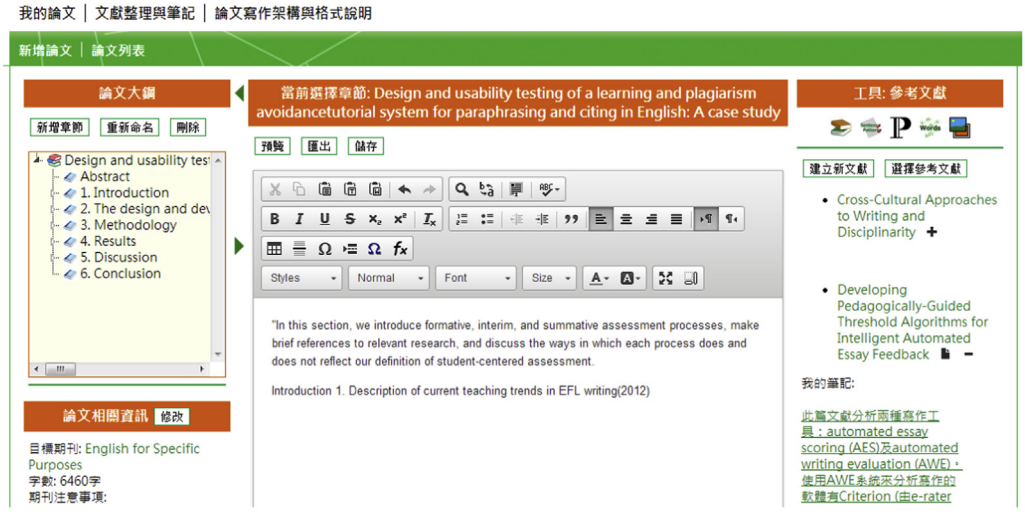

Fig. 3. *Outline-developing* area (left panel), *Writing Area* (central area), and the *Tools* (right panel).

Fig. 4. "My Paper": *Outline-developing* area (left panel) and the *Tools* (right panel).

2.1.3. *"Organization, Verb Tenses and APA Citation Style" (GBWI and learning materials module)*

EJP-Write provides learning materials and instructions to enhance users' knowledge and skills for academic journal writing, including: (1) an introduction to this genre; (2) rhetorical moves with example paragraphs for the Abstract, Introduction (including the literature review), Methodology, Results, Discussion (IMRD) and Conclusion (see Fig. 7); (3) instructions and examples of verb tenses for different sections (see Fig. 8); and, (4) examples of the APA format for in-text citation and the list of references. Moves may have disciplinary variations (Basturkmen, 2012; Kuteeva, 2013; Lin & Evans, 2012; Samraj & Monk, 2008); as such, it should be noted that the materials analyzed and then developed by the researchers for this system relate to e-learning and education.

2.2. *Research questions*

Among the various models that are used to evaluate e-learning pedagogies, the widely-applied Technology Acceptance Model (TAM; Davis, 1989) evaluates user attitudes and predicts intention to use a given technology based on perceived usefulness and perceived ease of

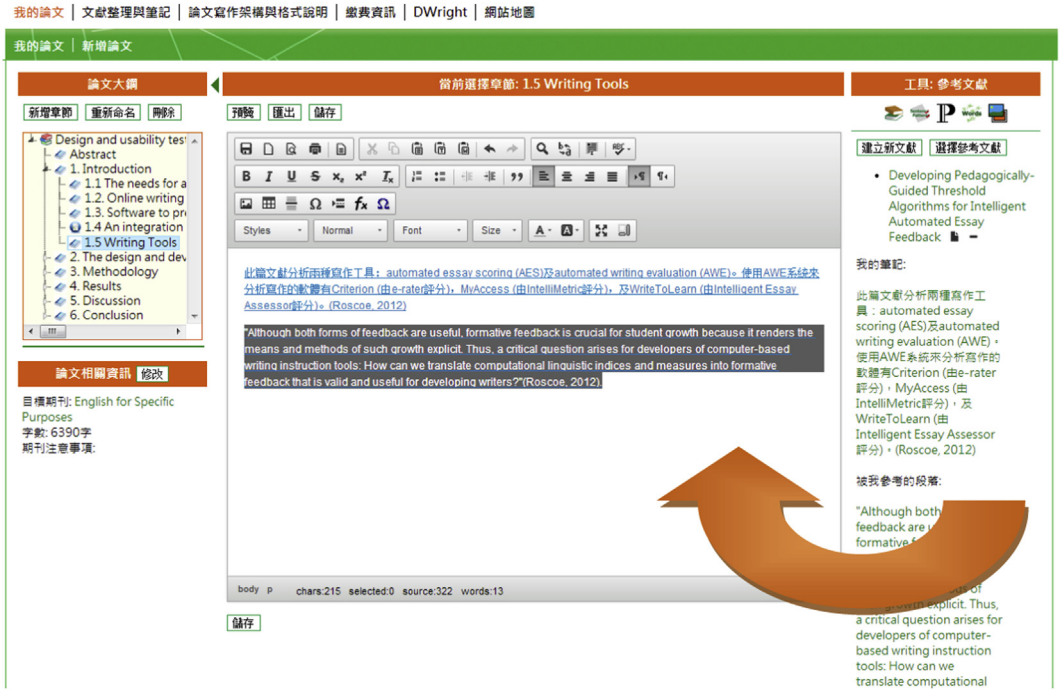

Fig. 5. Inserting references (quotes, notes, authors and publication years) in a single drag.

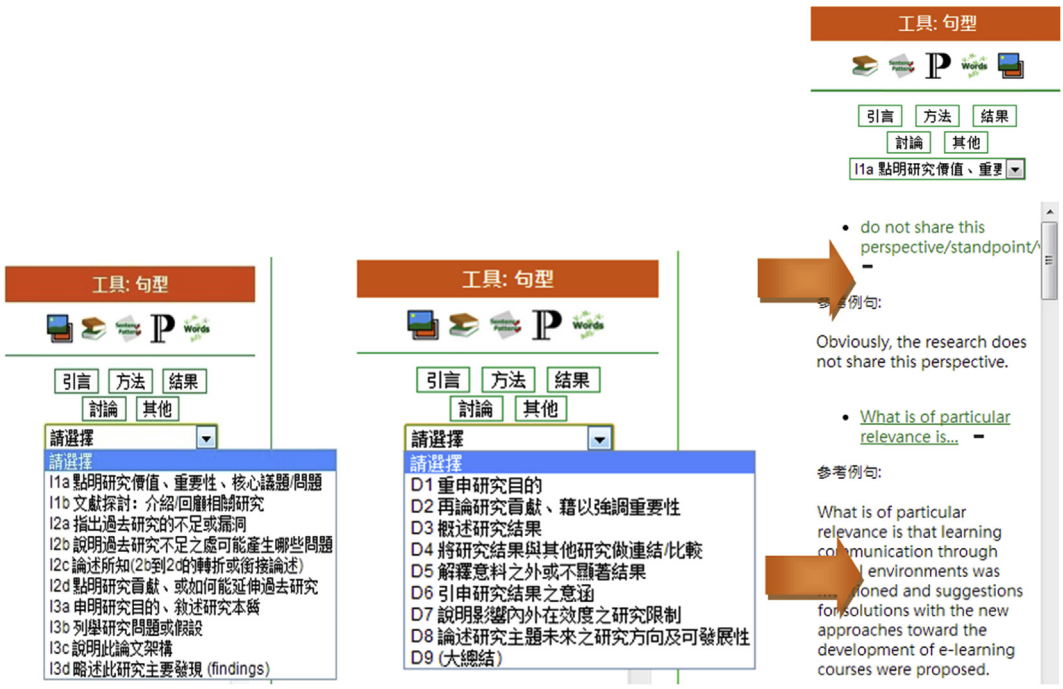

Fig. 6. Clicking on a chapter to show the related moves, phrase templates and example sentences.

use (Liaw & Huang, 2013; Persico, Manca, & Pozzi, 2014; Yeh & Teng, 2012). *Perceived usefulness* is "the degree to which a person believes using a particular system would enhance his/her job performance" while *perceived ease of use* (or *perceived usability*) means "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p. 320). Using TAM, the present study aimed to answer the following questions:

1. Regarding perceived usefulness (i.e., content effectiveness), does *EJP-Write* help users write English journals more effectively? The evaluation includes the following aspects: (a) instructions related to the genre and moves; (b) instructions on verb tenses and APA citation format; (c) phrase templates with examples; (d) paragraph templates with examples; and, (e) collocations.
2. Regarding perceived usability (i.e., ease of use), does *EJP-Write* help users write English journals with less effort? The following aspects of the interface design and functionality were evaluated: (a) developing outlines; (b) writing and editing online; (c) collecting references and taking notes; and, (d) the five functions in *Tools*, which include (1) citing references, (2) checking rhetorical moves and phrase templates, (3) checking paragraph templates, (4) checking collocations, and (5) inserting figures.
3. What factors influence user attitudes? Based on the literature and TAM, the factors examined in this work were writing anxiety (Pichette, 2009), perceived usefulness (Shee & Wang, 2008; Sun, Tsai, Finger, Chen, & Yeh, 2008; Wang, 2003), perceived ease of use (Bury & Oud, 2005; Shee & Wang, 2008; Sun et al., 2008), and personalization (Shee & Wang, 2008).
4. Does user attitude have direct and positive effects on the intention to continue using *EJP-Write*?

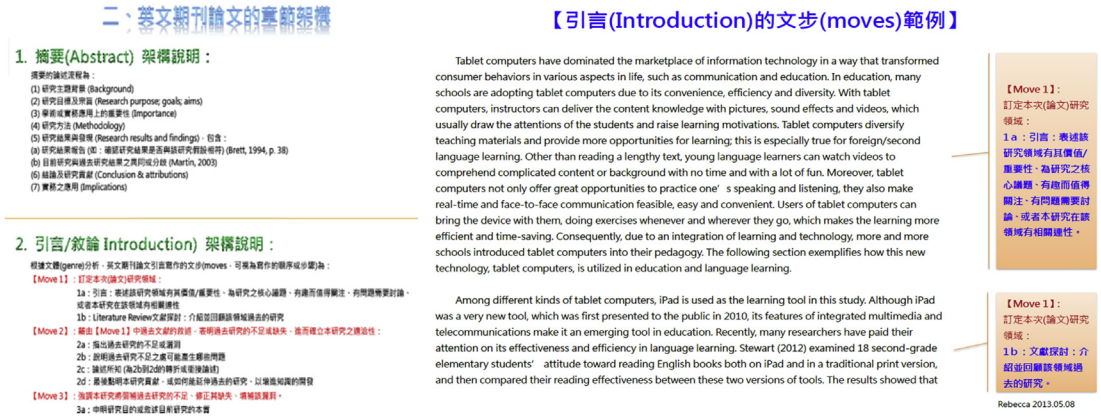

Fig. 7. Rhetorical moves for all sections (Abstract and IMRD) with example paragraphs.

Fig. 8. Descriptions and examples of verb tenses used in every section of a paper.

The model proposed in this work, and the hypothesized paths among the factors, are shown in Fig. 9.

3. Methodology

This study evaluated whether the *EJP-Write* system can help users write better journal papers. Specifically, to investigate the effectiveness of integrating GBWI and CALL, quantitative data were analyzed to evaluate the relationships among the various factors mentioned in the previous section, and qualitative data were also used to provide supplementary information regarding content effectiveness and system functionality.

3.1. Data collection instruments

A questionnaire survey ($N = 35$) was used to examine the research questions while the semi-structured interviews ($N = 14$) were conducted to gather additional information related to usefulness and usability evaluation. The following six dimensions and their interrelationships were explored in the survey: writing anxiety, usefulness, usability, personalization, user attitudes and continued usage intention. A five-point Likert scale (5 = strongly agree and 1 = strongly disagree) was used in the questionnaire. Regarding the interviews, the interviewer guided the sequence of the questions based on the participant's responses in order to collect more detailed data. NVivo 9 was used to categorize and analyze the qualitative data.

3.2. Participants and location

Thirty-five Chinese-speaking participants were recruited at a research-based university in Taiwan, and their demographic details are shown in Table 2. The participants had experience writing research papers in English, and had the need and motivation to improve their writing skills, including the two undergraduate participants. Most participants stated that they intended to or already had submitted conference papers, proposals, journal articles, theses or dissertations at the time of the survey, and so were considered appropriate subjects to evaluate *EJP-Write*.

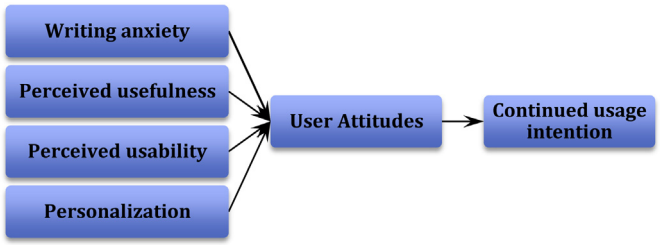

Fig. 9. Proposed model and hypothesized paths among the factors.

Table 2
Demographic details of the research participants.

	Details	Number	Percentage
Gender	Male	15	44%
	Female	20	56%
Education	Assistant Professor	1	2.86%
	PhD	6	17.14%
	Master	26	74.29%
	Undergraduate	2	5.71%
English proficiency level according to Common European Framework of Reference for Languages (CEFR)	A1 ~ A2	8	22.85%
	B1 ~ B2	20	57.14%
	C1	1	2.86%
	N/A	6	17.14%

The study was executed in mid-2013, where an orientation and four 1-h trial sessions were conducted in a newly constructed hypermedia laboratory. Updated computers, a library e-resources system and the Internet were accessible to the participants. The researcher was also present throughout the trial sessions to answer the few questions that were asked, of which most were related to marking the topic sentence in the *Writing Area* and inserting references into the in-progress paper. Nevertheless, the researcher did not intervene the using of EJP-Write or the developing process of their research papers. Neither did the researcher attempt to conceal or understate technical errors (bugs) found or asked. In addition, no question related to English writing or grammar was asked. Therefore, the presence of the researcher was not considered a contextual factor to influence the results.

3.3. Data collection and analysis

The 35 participants attended a one-hour computer-based orientation session to learn how to use *EJP-Write*, during which the researcher demonstrated all features and learning materials in the system. The participants were informed and fully aware that their goal was to try to write an academic paper using *EJP-Write* but not necessarily to complete the paper due to the time constraints. Then, they were asked to prepare a research topic and related articles to the four 1-h trial sessions, so that they would be able to try out the reference-collecting features, develop an outline and start writing their paper on the system. The trial was a week long, and during the sessions, the participants read all instructions and learning units about journal paper writing, developed outlines, uploaded references, and produced a draft of their research papers to different degrees. They also needed to use *Tools* to cite references, insert figures, and check moves structure, phrase templates, paragraph templates, and collocations. They then completed the questionnaire survey after the last trial writing session.

The items in the questionnaire (see Appendix B) include the following dimensions: usability (Bury & Oud, 2005); attitude and persistence (Fang, 2010; Hsu & Lin, 2008); English writing anxiety (Pichette, 2009); and usefulness, usability and personalization (Shee & Wang, 2008; Sun et al., 2008; Wang, 2003). In addition to triangulation, Cronbach's Alpha was determined and indicates that the reliability of each dimension was acceptable, with some excellent results in terms of consistency and robustness (Bao, 2010) for writing anxiety, usefulness, usability and attitude (see Table 3). Overall, the survey responses in the questionnaire were deemed reliable. Pearson correlation analysis was also conducted to evaluate the linear associations among the dimensions.

Further, structural equation modeling (SEM) was performed to estimate the effects of each path and test the relationships among the dimensions, in which writing anxiety, usefulness, usability and personalization were exogenous variables, while attitude and continued usage intention were endogenous ones. NVivo 9 was used to analyze the interview transcripts in order to identify the strengths and weaknesses of *EJP-Write*. Specifically, ideas with regard to content effectiveness were grouped into positive comments, items needing improvement and suggestions, based on different learning topics, such as moves structure, phrase templates, examples of APA citation style, and so forth. Likewise, ideas with regard to system functionality were also grouped based on different features of *EJP-Write*, such as those for developing outlines, citing references, and taking notes. The data were classified and analyzed based on how many times each idea was mentioned with respect to the total number of responses. Data consistency was confirmed and data triangulation was applied for reliability and validity (Patton, 2002).

4. Results

This section offers the results of this study and addresses the research questions.

4.1. Perceived usefulness (i.e., content effectiveness) of EJP-Write

Table 4 shows the quantitative results regarding the perceived usefulness of *EJP-Write*, and indicates that respondents felt the content was effective (mean = 4.15).

Table 3
The dimensions and their Cronbach's Alphas.

Dimension	Cronbach's Alpha
Writing anxiety	0.887
Perceived usefulness	0.856
System usability	0.884
Personalization	0.691
Perceived attitude	0.832
Persistence	0.597

Table 4
Quantitative results for the perceived usefulness of *EJP-Write*.

Learning materials in *EJP-Write*	Mean	SD
1. In "Organization, verb tenses and APA citation style", the instructions on rhetorical moves for all sections (abstract and IMRD) along with example paragraphs are useful.	4.40	0.497
2. In "Organization, verb tenses and APA citation style", the instructions on verb tenses and APA citation style are useful.	4.20	0.719
3. In "Practice", *EJP-Write* provides useful sentence/phrase examples.	4.06	0.873
4. In "Tools", the sentence/phrase templates for each move are useful.	4.14	0.550
5. In "Tools", the paragraph templates for each section are useful.	4.11	0.718
6. In "Tools", the word combinations in the collocation checker are useful.	3.77	0.843
7. The materials in *EJP-Write* meet the need of its users.	4.06	0.725
8. Using *EJP-Write* has enhanced the quality of my writing.	4.34	0.591
9. Overall, the instructions and learning materials are useful.	4.26	0.611

The qualitative results with respect to the perceived usefulness of *EJP-Write* are presented below, grouped by (A) positive comments, (B) items needing improvement and (C) suggestions, as seen in Table 5. Among all instruction sets, *the instruction on verb tenses* attracted very strong accolades, without any criticism or suggestions. In contrast, while *sentence/phrase templates* and *list of moves and paragraph examples* had the most positive comments, there were also a number of comments and suggestions on how to improve these features. *The introduction on the importance of writing* was the least mentioned of the features, with no comments or suggestions being made about it.

Overall, the results were very positive and indicate that *EJP-Write* provided useful and a variety of learning materials to help students improve their writing of journal articles.

4.2. *Perceived usability of* EJP-Write

Table 6 shows the quantitative results with regard to the perceived ease of use of *EJP-Write* (mean = 4.00), and indicates that the participants felt the system was easy to use.

The qualitative results of the perceived usability of *EJP-Write* are presented in Table 7, and again grouped by (D) positive comments, (E) items needing improvement, and (F) suggestions. In addition to the results in Table 7, *Outline developing* also had many positive comments (total references = 40), along with some remarks for improvement (total references = 10). Further, the least mentioned features were *Word counting*, *Paragraph template checking*, and *Target journal selecting and background information developing*.

In general, the results were positive, and participants were impressed by the design ideas and by how *EJP-Write* helped speed up writing progress. However, a number of suggestions and comments for modifying *EJP-Write* were given, which could help refine and improve the system further.

4.3. *Factors that are effective on user attitude*

The path analysis results obtained using SEM are shown in Table 8, and indicate that perceived usefulness and perceived ease of use had positive and significant effects on user attitude, with the former having relatively stronger influence ($\beta = 0.334$, $p = 0.016 < 0.05$). In contrast, the results show that writing anxiety and personalization did not significantly influence user attitude.

Table 9 shows that all variables were significantly and positively correlated with each other, with the exception of writing anxiety.

Two factors, perceived usefulness and perceived usability, influenced user attitude toward *EJP-Write*, while writing anxiety and personalization did not, as shown in Table 10. More specifically, although participants held positive views of the personalization feature in *EJP-Write*, which enabled them to control their learning progress (Mean = 4.14) as well as find and learn needed content (Mean = 4.00), the SEM results show that this did not significantly affect user attitude toward the system (see Table 5).

4.4. *User attitude and continued intention to use* EJP-Write

As Table 9, user attitude had a positive and significant impact on continued usage intention ($\beta = 0.981$, $p = 0.038 < 0.05$). The proposed model and the hypothesized paths among the factors are shown in Fig. 10, below.

The overall fit of the hypothesized model was assessed using a series of fit indices: ratio of Chi-Square to degrees of freedom (X^2/df), Root Mean Square Residuals (RMR), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square of Approximation (RMSEA). Ultimately, only the Chi-square to degrees of freedom ratio reached the criterion ($2.489 < 3$), while RMR = $0.156 > 0.05$; GFI = $0.423 < 0.9$; AGFI = $0.339 < 0.9$; and RMSEA = $0.209 > 0.08$; thus the model fit is less satisfactory than anticipated (Lin, 2012). The quantitative and qualitative results with regard to the effects that perceived usefulness and usability have on user attitudes, and thus continued usage intention, are presented in the following.

Overall, participants held a positive attitude toward *EJP-Write* (mean = 4.26), with the content and functionality of the "Organization, verb tenses and APA citation" feature receiving the most positive ratings (mean = 4.34), followed by those for "References and notes" (mean = 4.31).

Regarding intention to continue using *EJP-Write*, results show that most respondents intended to do so (mean = 3.91), with the majority agreeing that using the system was a worthwhile experience (mean = 4.40). Overall, the results indicate that most participants intended to continue using *EJP-Write* (mean = 4.15) and, as previously reported with regard to the results of the SEM path analysis, user attitudes had an influence on this intention.

Table 5
Qualitative results for the perceived usefulness of *EJP-Write* (i.e., content effectiveness).

A. Positive comments about the most mentioned *EJP-Write* learning and reading materials	Mentioned/total number of references
A-1. The Tools – sentence/phrase templates & examples (Fig. 6)	72/394
(1) Very practical, useful and most impressive	
(2) There are many choices and examples to enrich the writing with various expressions that are appropriate for journal papers	
(3) Very helpful and great references for inexperienced student writers and English learners	
(4) Time-saving and convenient, because we don't have to search for templates and examples again	
A-2. Instructions on verb tenses in each chapter (Fig. 8)	62/394
(1) Very helpful, practical, clear and important for writing and learning	
(2) Professional	
(3) Great instructions with sufficient examples	
(4) Clear layout and arrangement – sequenced with IMRD	
A-3. List of moves and example paragraphs based on rhetorical moves (Fig. 7)	61/394
(1) Clear descriptions and wonderful examples	
(2) Very helpful and practical for overall organization	
A-4. Overall positive feedback regarding EJP-Write content (i.e., the learning materials)	57/394
(1) Very helpful, practical and detailed materials with clear and organized instructions and abundant examples; it helps users grasp the essence of journal paper writing	
(2) Great for use in a Research Methodology class – EJP-Write is like the teacher in an academic/research methodology class	
(3) Great for novice writers	
B. Items needing improvement regarding the most mentioned *EJP-Write* learning and reading materials	**Mentioned/total number of references**
B-1. Tools – sentence/phrase templates & examples (Fig. 6)	5/26
(1) Some templates have only one example sentence	
(2) The phrase templates in the Methodology Section are more for qualitative research	
(3) The examples do not have Chinese translations	
B-2. Tools – paragraph templates	5/26
(1) The paragraph template for the Methodology Section (qualitative research) looks complicated	
(2) This part is relatively less helpful for me	
B-3. Tools – collocation checker	5/26
(1) The corpus is limited; I can't find the words I want.	
B-4. List of moves and paragraph examples based on rhetorical moves (Fig. 7)	5/26
(1) This is for the field of e-learning and education; other disciplines might have different rhetorical moves	
(2) The Methodology part is more for qualitative research, rather than all types of research methods	
C. Suggestions for the *EJP-Write* learning and reading materials	**Mentioned/total number of references**
C-1. Tools – Moves (On the left of Fig. 6)	4/21
(1) Add different moves for other disciplines	
(2) Add different moves for other research methods	
(3) Add an English version	
C-2. Tools – collocation checker	4/21
(1) Make the Collocation Checker a Synonym/Antonym Checker (i.e., a thesaurus)	
(2) Expand the corpus	
(3) Add Spell check or Auto-correction	
C-3. List of moves and paragraph examples based on rhetorical moves (Fig. 7)	4/21
(1) Provide a more detailed description for each move	
(2) Rearrange the sequence: Show the reading materials after the users first log into the system instead of directing them to "My Paper" first	

5. Discussion

This section discusses the results as they relate to the research questions regarding: (1) perceived usefulness (i.e., content effectiveness); (2) perceived usability (i.e., ease of use); (3) factors affecting user attitude; and, (4) whether user attitude has any influence on the intention to continue using *EJP-Write*.

5.1. *Perceived usefulness of* EJP-Write *with respect to the instructions and examples for (a) genre and moves structures, (b) verb tenses and APA citation format, (c) phrase templates, (d) paragraph templates, and (e) collocations*

Overall responses toward the content of *EJP-Write* were very positive, which validates the initial design rationale and echoes the findings of previous GBWI studies into the pedagogy of journal paper writing (Bailey, 2010; Cheng, 2007b; Cortes, 2013; Flowerdew, 2000; Khodabandeh et al., 2013).

Interestingly, based on the quantitative results, *the instruction on rhetorical moves with example paragraphs* was considered by all participants as the most useful part of the system (see Table 6 and Fig. 7.), while *the phrase templates with examples* was the feature most highly regarded in the qualitative results (see Table 7 & Fig. 6). These findings imply that not only is the teaching of genre and moves useful, and indeed critical, for better writing (Cargill et al., 2012; Feak & Swales, 2009; Hyland, 2009; Swales, 1990; Swales & Feak, 2009), but also that

Table 6
Quantitative results for the perceived usability of *EJP-Write*.

Features and functions in *EJP-Write*	Mean	SD
1. *EJP-Write* is easy to use	3.83	0.857
2. *EJP-Write* provides clear directions and guidance	3.71	1.073
3. In "My papers", the features to develop an outline, such as *Add a new heading* and the *Add a new subheading*, are easy to use	4.23	0.877
4. The editing feature in the *Writing Area* of "My Papers" is easy to use	3.60	0.976
5. The *References* feature in the *Tools* to both read and insert references and notes is easy to use	4.29	0.622
6. The *Sentence/phrase templates* feature in the *Tools* to check and insert templates of rhetorical moves is easy to use	4.11	0.796
7. The *Paragraph templates* feature in the *Tools* to check and insert templates is easy to use	4.00	0.767
8. The *Collocation Checker* in the *Tools* is easy to use	3.74	0.886
9. The *Add a new reference* feature in *References and Notes* to organize and upload references is easy to use	4.34	0.591
10. The *Practice* feature to practice writing and consult example sentences is easy to use	4.00	0.728
11. The interface and features related to the reading materials in *Organization, verb tenses and APA citation style* are easy to use	4.20	0.797

the use of lexical-semantic support (e.g. linguistic forms for different moves) is helpful and better able to meet user needs (Carrió-Pastor, 2013; Cortes, 2013; Hyland, 2009; Hyland & Tse, 2009). That is, the scaffolding of words and phrase templates complement GBWI in which the moves structures provide specific directions and ideas, while the phrase templates have the linguistic function of offering clear examples for the meaning of the moves structures. Examples of the participant using EJP-Write phrase templates are given in Appendix C. The results also suggest the possibility that this system could in certain capacities assist teachers in the teaching process. The above points are reflected in the following comments from the interview participants, which were translated from Chinese by the interviewer, and confirmed by the researchers.

"These learning units, such as the function and purpose of genre and moves, verb tenses and so on, were what I was taught in Research Methodology class."

"It would be great to integrate this [system] into Academic Writing class or Research Method class."

Furthermore, the templates and examples provided in a traditional classroom and class handouts may be relatively limited in comparison to what *EJP-Write* offers, with 674 phrase templates and about 1000 examples. The comments and suggestions also show that the users relied on this feature for their journal writing, and that phrase templates with examples are a necessary feature for an online writing system. However, more empirical research comparing traditional classroom learning, embedded-learning and standalone-learning is needed to ascertain the effectiveness of different GBWI settings with regard to research paper writing. Moreover, such research could also help clarify the role of the teacher, and how technology can benefit and facilitate writers by providing a user-/learner-friendly environment when a qualified teacher is unavailable.

Besides the benefit of using phrase templates to achieve this writing task, a potential problem is related to patchwriting, which the respondents might not be aware of. Patchwriting tends to happen when one reads and writes at the same time, and when one lacks the strategies of paraphrasing (Liu et al., 2013). Therefore, a link to DWright to prevent plagiarism and patchwriting is also provided in EJP-Write (please refer to Liu et al., 2013). This may also leave room for discussion as to what extent templates should be directly used.

Another intriguing finding relates to the instruction of verb tenses (see Fig. 8). Participants greatly appreciated this feature, and mentioned that they made use of it very often when writing. Moreover, no criticisms or suggestions for improvement were made about this feature in the interviews, and so it was deemed as the most satisfactory one in the system:

"I kept checking this page when I was writing."

"This is what we've been taught in Academic Writing class."

The function of verb-tense instruction is similar to that of the phrase templates, which are used to complement the GBWI content of a writing system for journal articles. Users reported feeling that they had more support when writing assistance was provided for both paragraph and lexical-semantic information and examples.

Regarding criticisms and suggestions, most of these were related to genre and time-constraints. As EJP-Write is a novel system and a work in progress that is still in the trial state, only a limited range of moves for a specific discipline has been developed so far, and the construction of the thesaurus and collocation features is ongoing. Further research on moves for different disciplines and research methods would thus widen the system's application to benefit more users.

Additionally, the suggestions concerning collocation checking indicate that writers/learners of English need various kinds of support and resources throughout the writing process, especially in a self-directed e-writing environment where a real teacher is not present to answer questions. From pragmatic to semantic and lexical supports, users need clear instruction on genre structure and rhetorical moves, as well as support for finding correct words. Consequently, more time may be needed to refine and develop *EJP-Write* so that it can better serve the needs of those requiring English academic writing assistance.

5.2. Perceived usability (i.e., ease of use) of EJP-Write *regarding (a) developing outlines, (b) writing and editing, (c) collecting references and note-taking, and (d) the five functions in the* Tools

Both the quantitative and qualitative results show that the features related to referencing were the most appreciated by the participants. Specifically, the feature of citing or reading the references and notes in *Tools* was considered the most useful for journal writing:

Table 7
Qualitative results for the perceived usability of *EJP-Write*.

D. Positive comments about the most mentioned *EJP-Write* functions and features	Mentioned/total number of references
D-1. Overall advantages of EJP-Write's functions	68/418
(1) Easy to use and simple – Compared to EndNote, the interface is a lot simpler and easier	
(2) Great, convenient and practical system – enough features, great functions	
(3) Well-developed and user-friendly	
D-2. Tools – Reference reading and inserting/recording (Fig. 5)	67/418
(1) Convenient, timesaving and practical	
(2) A fascinating and winning feature	
(3) Helps you to organize and remember your ideas	
(4) Simpler layout compared to EndNote	
(5) Helps prevent plagiarism	
D-3. Quotes, notes saving and editing	51/418
(1) Very simple, easy to use, great and practical	
(2) Timesaving and convenient	
(3) Helps organize your references and research ideas	
D-4. Reference adding and uploading	42/418
(1) Ease to use, simple and user-friendly; easier and simpler than EndNote	
(2) Timesaving and convenient	
(3) Helpful for collecting and arranging references	
E. Items needing improvement regarding the most mentioned *EJP-Write* functions and features	**Mentioned/total number of references**
E-1. Writing Area – Editing (Fig. 3)	51/167
(1) There are not enough editing features and they are not user-friendly enough	
(2) It does not auto-save my work	
(3) There are mistakes in marking the topic sentences red – sometimes the whole paragraph is marked red	
E-2. Miscellaneous – Features not in EJP-Write or related to reading materials	40/167
(1) The interface and buttons are confusing in the Organization, moves, verb tenses and the examples for APA citation style section	
(2) I cannot preview or export the paper	
(3) There are no "Previous" and "Next" buttons	
(4) The wording is too academic	
(5) There is no translator	
E-3. Tools – managing figures	12/167
(1) The path to upload figures and then go back to the Writing Area is confusing – I felt like I was lost	
(2) The size of the figures cannot be modified	
F. Suggestions for the most mentioned *EJP-Write* functions and features	**Mentioned/total number of references**
F-1. Miscellaneous – Features not in EJP-Write	78/202
(1) Improve the interface for learning materials; modify buttons or layout to be more user-friendly	
(2) Add reminders and guidance or a sitemap	
(3) Add a Spell check and Plagiarism detector	
(4) Add dictionaries and a thesaurus, or even a Chinese-English Translator.	
(5) Automatically list, organize, or even correct the reference list	
(6) Add a "Preview" feature	
(7) Add a search bar to look for certain materials in EJP-Write or online	
(8) Modify the wording in the system and reading section to be less academic	
(9) Provide an English version of EJP-Write	
(10) Provide feedback for writing	
(11) Add a timer	
(12) Add a URL AutoSave feature	
(13) Provide more journals to choose from	
F-2. Writing Area – Editing (Fig. 3)	31/202
(1) Improve the editing features so that they are similar to those in MS Word	
(2) Autosave any changes to the text	
(3) Provide a more user-friendly approach to mark the topic sentence	
(4) Provide the default format for a given journal	
F-3. Outline developing (Fig. 4)	14/202
(1) Offer a default outline based on moves, or provide a checklist for users to add selected headings to their outlines	
(2) Be able to add emphasis to the first/upper level headings, such as making text bold or italicizing it.	
(3) Enlarge icons and simplify buttons – some of the functions of different buttons are similar to each other	

Table 8
Path analysis results for the proposed model.

Path	Estimate	Std. Estimate	S.E	*P*-value
Perceived Usefulness → User Attitude	.334	.655	.139	.016*
Perceived Ease of Use → Attitude	.261	.524	.125	.037*
Writing Anxiety → Attitude	.032	.113	.037	.386
Personalization → Attitude	.080	.244	.097	.407
Attitude → Continued Usage Intention	.981	1.073	.472	.038*

"→" indicates a path relationship, those on the left being exogenous factors and those one the right being endogenous ones. "*" indicates that the path estimate is significant at the 0.05 level (two-tailed).

"You can cite a source [with author names and year] simply with one drag and read a reference with one click. How convenient!"

"You get all the references needed in the Tools, instead of looking for them in different folders or online. It's very organized."

Similarly, the functions for adding/uploading references and saving/editing quotes and notes were also seen as user-friendly, timesaving and practical, as the following two reasons indicate:

"It is a lot easier and simpler than EndNote to add referencing information."

"It helps classify my references – you won't forget or be confused with where the ideas were coming from, nor will you mix your ideas with the sources [unintentional plagiarizing]."

Future research that compares different software for collecting and citing references might provide some useful insights into how collecting references efficiently and citing sources correctly influences overall research productivity and unintentional plagiarism.

Outline developing was seen as an easy-to-use feature (see Table 8), but was identified as needing adjustments (see Table 9). One suggestion was to provide a default or self-selected outline based on moves structure, which would then implicitly guide users to follow the correct rhetorical moves, thereby saving time and effort when developing an outline. More empirical study into the efficacy of developing outlines based on the rhetorical moves for research papers might help to verify the effectiveness of this approach. Moreover, providing an interactive feature to help in developing the moves structure could benefit *EJP-Write* users from different disciplines. Such a feature could integrate the Swalesian and Sydney School approaches (Swales, 2011), in which students are also involved in developing the moves structure while *EJP-Write* works as the instructor.

Another interesting finding was regarding *Target journal selecting and background information developing*. Many studies have noted that more effective writers often select a target journal before writing (Belcher, 2009; Cargill & O'Connor, 2013; Driscoll & Aquilina, 2011; Glasman-Deal, 2010; Murray, 2009), yet this feature was the least mentioned in the current study. This result implies that there is a knowledge gap between the writing teachers/experts and the majority of the students/participants regarding effective journal paper writing. As such, *EJP-Write* could substitute as a teacher to remind users to select and learn about a target journal early in the writing process.

Besides a call to improve the editing feature in the *Writing Area*, the users requested a variety of other linguistic functions to solve their language problems, such as a spell check, plagiarism detector, dictionaries, thesaurus, and Chinese-English translator. These results accord with those concerning content effectiveness, in which many users called for a larger collocation corpus and Chinese translations for all the example sentences. With considerations regarding the issues of L1 interference that could result in transferring L1 rhetorical patterns to English discourse or omitting certain moves (Grujicic-Alatriste, 2013; Pérez-Llantada, 2014; Sheldon, 2011), program developers might consider offering more writing assistance (e.g. translation) to help the users grasp the meaning of provided templates and examples, and even enhance L2 acquisition (Gross, 2013; Källkvist, 2008) in the system. As the requests reflect users' actual writing needs, future research could further investigate whether English native speakers (NES) would have needs different from their NNES counterparts, and thus alter the outcomes of TAM.

5.3. Factors that influence user attitudes

Unlike the variables examined in previous studies (Pichette, 2009; Shee & Wang, 2008), writing anxiety and personalization had little influence on the participants' attitudes, while perceived usefulness and perceived usability had greater effects (Bury & Oud, 2005; Shee & Wang, 2008; Sun et al., 2008; Wang, 2003). Moreover, the weak impact of writing anxiety and personalization on user attitude might be the reason why the model fit was less than satisfactory, which also suggests that there could be other variables that should be examined in this

Table 9
Pearson correlations among the variables.

	Writing anxiety	Perceived usefulness	Perceived usability	Personal-ization	User attitude	Continued usage intention
Writing Anxiety	1					
Perceived Usefulness	−.222	1				
Perceived Ease of Use	−.272	.735**	1			
Personalization	−.355*	.602**	.662**	1		
User attitude	−.136	.618**	.847**	.638**	1	
Continued usage intention	−.182	.748**	.689**	.466**	.736**	1

*. Correlation is significant at the 0.05 level (two-tailed).
**. Correlation is significant at the 0.01 level (two-tailed).

Table 10
Quantitative results for writing anxiety.

Writing anxiety	Mean	SD
1. I look forward to writing down my ideas in English	2.14	0.974
2. I avoid writing in English	2.66	1.187
3. I am afraid of writing essays in English when I know they will be evaluated	3.37	1.114
4. I am nervous about writing in English	3.26	1.291
5. I never seem to be able to clearly write down my ideas in English	3.69	1.105

context. Another possibility is that only perceived usefulness and usability affected user attitude, and that the users did not feel anxious or require more personalized features. The participants' positive attitudes toward content usefulness and system usability can be seen in the following excerpts from the interview transcripts:

"[The materials are] Very thoughtful and impressive. They can help teachers because you have all the materials with referencing features. Those [materials] were what I was taught in Research Methodology/Academic Writing class."

"There are some technical errors (bugs) to be fixed and aspects to be improved, but this is a promising system for journal paper writing."

Many of the interviewees were intrigued by the initial design ideas and very supportive and encouraging. They also suggested that the system could be used for term paper writing, due to the similar formats and content.

In future, program designers might attempt to conduct a needs analysis and market research to identify user goals in the design phase in order to provide more tailored content and functions to increase the degree of usefulness and usability as measured by TAM. Furthermore, although writing anxiety and personalization might affect certain group of users (Liaw & Huang, 2013), it was user needs that affected perceived usefulness and usability in this study, which fundamentally impacted user attitude, as supported by the qualitative results.

5.4. User attitudes and continued usage intention

Overall, the quantitative results show that user attitudes had a positive influence on continued usage intention, as reported in other studies (e.g. Lee, 2010). Intriguingly, although the qualitative results suggest that the users had mixed feelings toward this system, they were still mostly positive. As highly valued as most features were, the suggestions indicated that the practical features needed improvement. While most of the users liked the learning materials and writing and research features, the editing feature reduced their willingness to use the system in the future. One reason for this could be that some of the participants needed to modify their way of writing and editing when using *EJP-Write*, which was a deterrent for future use. Program designers might thus consider modifying the editing feature so as to make it more intuitive when users adopt *EJP-Write*. Another reason why some users had less intention of using the system was that they had already published a paper and were not planning on writing another. This may explain why the quantitative results for the item asking whether the respondents would continue to use *EJP-Write* indicate that they were less likely to continue doing so. More specifically, some users might have felt that they already knew how to write journal papers, or that they no longer had a need to publish papers and therefore, lacked this motivation to improve their writing. Still, the overall qualitative and quantitative results indicate that most users intended to use the system to write their journal papers.

Furthermore, while the results were positive, the quantitative results revealed that participants from different backgrounds actually had different opinions toward the use of *EPJ-Write*. For example, a participant from the Institute of Education provided many suggestions on the wording, buttons and layout of the system, claiming that these factors affected reading and overall learning outcomes. Another group of participants with e-learning and computer science backgrounds ($N = 3$) commented more on the functions and technical design; by contrast, participants with English teaching and linguistics backgrounds ($N = 6$) seemed more tolerant toward the layout and interface design, and had very positive views of the materials. These differences suggest that users had varying needs, learning goals, writing habits, and expectations of the system, which complicates the design but provides direction for continued improvement.

5.5. Research limitations and future studies

One limitation of this work is that the researchers were able to recruit only a limited number of participants and provide four one-hour writing sessions. Future studies into *EJP-Write* could consider incorporation into a required class so that users have a greater amount of time and support to better understand the system and provide extended feedback. In addition, future work could compare *EJP-Write* with other

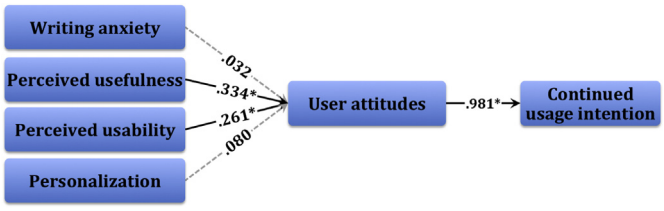

Fig. 10. Results for the proposed model and related path coefficients.

writing systems regarding actual writing product, including linguistic features and forms, produced through using the systems, as well as overall improvement of academic writing, to determine which system or features are better able to help students and teachers prepare articles for publication. Researchers could also consider comparing the effectiveness of the following three teaching/learning contexts: a traditional classroom, where a teacher prepares the materials and teaches without any writing system being involved; an e-learning environment where *EJP-Write* is blended into classroom teaching and writing; and a self-directed learning and writing experience. Moreover, future research may provide more insights into the most effective e-learning and English writing pedagogies by investigating both the perceptions of writing experts and actual writing outcomes of student writers after using such a writing system. Therefore, empirical and longitudinal research into the progress of NNES when using *EJP-Write* could provide more information with regard to the kind of lexical, semantic, and pragmatic support necessary for writing journal articles online.

6. Conclusion

This study evaluated the efficacy of *EJP-Write*, aiming to identify factors influencing user attitudes and the continued intention to use the system. The results confirmed that perceived usefulness and perceived usability significantly affect user attitudes, and thus continued usage intention, while writing anxiety and personalization has less impact. The findings support earlier works in which genre-based approaches were suggested for journal paper writing pedagogy (Cargill & O'Connor, 2013; Cargill et al., 2012; Chang & Kuo, 2011; Hartley, 2012; Khodabandeh et al., 2013; Wingate, 2012), in which perceived usefulness and usability affected user attitudes and continued usage intention (Liu et al., 2013). This paper's contribution targets content and interface design for academic journal paper writing in the discipline of e-learning and education. Regarding content, this study found that a self-directed system for journal writing needs to include: (a) explicit instructions on rhetorical/moves structure for different disciplines; (b) sentence/phrase and paragraph templates; (c) instructions on verb tenses and citation formats; and (d) support for collocations and finding the correct word. Moreover, users need to understand GBWI before starting actual writing, and be provided with abundant templates and examples to help deal with their specific needs as they arise. Regarding the features of *EJP-Write*, participants reported that the following were the most important: (a) developing outlines; (b) collecting, reading and citing references; and (c) writing and editing, with the functions of the latter being as similar as possible to those in MS Word.

It is suggested that content and system developers conduct needs analysis (Spence & Liu, 2013) for student users and teachers to better understand what features are required, as well as to carry out market research to investigate similar systems, in order to include the best features and identify the market niche of this product. Moreover, involving users in move structure development could take advantage of both the strengths of different GBWI approaches, and solve issues related to disciplinary variations in move structure. More inter-department collaboration would thus be needed among system developers, English writing experts and practitioners to provide a more effective and easy-to-use system – one that represents a true integration of language pedagogy, writing practice and technology.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.compedu.2014.06.007.

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