Application Research of Computer-Assisted Technologies in EAP Module Learning

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Abstract: Recent years have witnessed the rise of various computer-assisted technologies and the growing number of EAP modules in both English-speaking and non-English-speaking countries. Meanwhile, studies on computer-assisted language learning (CALL) have been prospering along the way. However, there has been by far few summaries on how these computer-assisted technologies lead to effective learning in EAP modules. The present study shows that while the link between computer-assisted technologies and learning outcomes has been made in previous scholarship in specific instances, it remains under-investigated how the role of computer-assisted technologies function to develop learning language skills and knowledge as a whole in EAP modules and how they are beneficial to the future professional development of the students. Further studies are necessary to explore how computer-assisted technologies are of benefit to learning in these two particular aspects by continuing exploration on how CALL is applicable in EAP modules that address learner professional needs.

1. Introduction

The world today has been continuously reshaped by the introduction of new technologies. In the realm of education, technology has significantly changed the way learning is organized and the outcome that learning achieves. Along the spectrum, language learning has been impacted by computer-assisted technologies, the academic aspect of which was looked into by previous scholarship, showing that computer-assisted language learning (CALL) managed to benefit the students in learner autonomy, engagement and higher-order critical thinking[1]. In the meantime, EAP modules as a prospering line of language education are designed to cultivate not only a range of knowledge and skills in English, but more general study skills for academic and professional purposes[2]. However, the link between computer-assisted technologies and its role in EAP modules has remained obscure, as a significant volume of literature is concerned with the procedural implementation of computer assisted programs, rather than the academic or professional outcomes from the perspective of the learners. As the application of computer-assisted technologies in EAP modules is meeting with ongoing challenges of user attitude, it becomes paramount to justify the important role that computer-assisted technologies play in delivering learning results demanded by

students. Hence, this paper is an attempt to summarize how computer-assisted technologies have benefited the language learning in EAP modules from the acquisition of language know and skills to learner professional development.

2. The rise of CALL

The widespread use of CALL in language education has been aptly illustrated in a few comprehensive syntheses. Grgurović et al. (2013), for instance, reviewed 72 studies from 1970 to 2006 and demonstrated its overall effectiveness[3]. Golonka et al. (2014) further reviewed technology types over 350 studies to prove that the effectiveness of CALL depended on the affordance of technology to pedagogical goals[4]. As digital networkable technologies become ubiquitous, CALL researchers placed more emphasis on how technologies impacted learning processes and outcomes with mixed methods (Felix 2005)[5]. With technology evolving in recent decades, CALL moves away from multimodal language input towards the integration of artificial intelligence. Virtual reality, informal digital learning and automated assessment have currently become the research foci (Degner et al. 2022)[6].

The development of CALL has been categorized into three phases, namely, "behavioristic", "communicative" and "integrative" CALL (Yim and Warschauer, 2016), which parallels the shifts of behavioristic, cognitive and sociocognitive perspectives in language learning theories[7]. Historically, CALL has been influenced not only by the relatively linear evolution of computer technology, but also by the disorganized and often contradictory trends of language learning theories, revealing the growth of CALL a complex and fascinating landscape (Davies et al. 2012: 19-38)[8]. As English teaching places increasing emphasis on academic skills, the historical development of CALL serves as a window of options for EAP teachers to adopt in appropriate contexts.

3. Language skills and knowledge in EAP modules

EAP modules, with its original goal to enable students to communicate English in a discipline-specific manner, establish students with academic language skills and knowledge for their disciplinary studies and professional careers (Hyland 2016: 23-24)[9]. The trajectory moves from focusing on generic skills and language features, which are regarded as transferable across disciplines. While ongoing research find generic features vary across disciplines (Hyland 2018), EAP's pragmatic goals placed emphasis on teaching the conventions of academic discourse, involving students identifying features of target genres in terms of rhetorical strategies, interactive intention and academic community[10]. However, being required to conform to institutional norms, learners are perceived as passive recipients of knowledge. With more emphasis on learners' role in language learning, EAP is increasingly recognized as a social practice involving students' engagement, interaction and understanding of the academic world. This shifts EAP teaching away from isolated texts towards contextualized communicative genres, rhetoric of disciplines and literacy skills in target language.

Drawing on broader theoretical ground, EAP modules have the tendency towards a socio-cultural, contextualized and humane orientation, and have particular interest in academic writing and vocabulary list (Crosthwaite et al. 2022)[11]. Technologies such as corpus and virtue reality are widely leveraged for EAP learning.

4. Learners' professional development in EAP modules

A less favored domain of research is the development of non-language skills among EAP learners or how the learning of English for academic purposes is linked to their professional expertise.

Communication in any language with a practical orientation should not be viewed as a pure linguistic phenomenon, as it is by nature a common part of new genres such as powerpoint, email, and poster, or even areas of professional life such as hiring, selection and performance appraisal (Hyland and Hamp-Lyons 2002)[12]. The industry-specific context in EAP modules demands the learners to maximize their input and experience, which means the tools of learning should be placed under their control (Hyland 2016). However, it is necessary to recognize that language skills and knowledge are closely related to learner professional development. Bias against non-native English speakers can be formed, for example, on their accent, making them seem less creditworthy. Therefore, it is imperative to examine how the needs for language knowledge and skills in EAP learning can be better satisfied. Huang (2013), for instance, conducts an assessment on language-related discipline-specific needs at the undergraduate and graduate levels and identifies the mismatch in academic language learning needs perceived by students and teachers[13].

5. The role of computer-assisted technologies in developing language skills and knowledge in EAP modes

Computer-assisted technologies are increasingly applied in EAP modules in many forms such as electronic learning platforms, online collaboration tools, corpus software and virtual reality. The underdevelopment of EAP modules in certain non-English speaking countries has been characterized by the insufficient supply of teachers of relevant interdisciplinary backgrounds, as they are typically educated only in language degrees without any academic orientation towards a particular specialization. Their lack of technological knowledge in using on-line collaboration tools would further aggravate the insufficient combination of computer-assisted technologies. This has prompted the need for the development of courseware integrating web-based digital tools and multimodal media to blend academic and language knowledge and skills in off-class learning environment (Wang et al. 2021)[14]. New technologies, such as virtual reality learning environment, can be of assistance in the development of writing skills, vocabulary knowledge and presentation skills (Pack et al. 2020)[15]. In the current age where distance learning becomes popular and immersive experience highly valued, virtual reality is potentially applicable in transforming traditional off-line classroom to a more accessible and interactive on-line forum open to international students to enhance their speaking and listening skills necessary for EAP modules (Coleman and Derry 2022)[16].

6. The benefit of computer-assisted technologies in learner professional development in EAP modules

Professional development has become an essential part of academic programs with practical training and practice. Need analysis in non-English-speaking countries shows that language processing capabilities related to a particular field, be it of communicative, linguistic, or textual nature, has been in high demand and should be considered as an indispensable component of EAP education design. However, not much existing literature has attempted to relate the design of instruction and course materials in EAP modules to future work-related contexts. Harvey and Stocks understand the needs of graduate students to work in multidisciplinary fields after graduation and conduct a qualitative investigation among students in multidisciplinary programs that indicates the requirement to blur the boundary between different genres in writing development. Lee and Lee examine a professional development program for graduate students that tailors pedagogical and language skills modules as well as workshops to meet various career needs. This is necessary as in many countries, the number of academic jobs are typically smaller than that of graduates with graduate degrees. Intercultural competence is also recognized as an extended skill for career-development in EAP modules, especially for those who have grasped English as lingua franca and incorporated the

awareness of dynamic hybrid cultures and the skills to successfully negotiate them.

7. Strategies for Applying Computer-Assisted Technologies in EAP Modules for Learners

To address the need for integrating computer-assisted technologies in English for Academic Purposes (EAP) modules, this paper will explore strategies that can be effectively employed by learners. The increasing demand for specialized language processing capabilities in non-English-speaking countries, as highlighted by Mak, underscores the necessity of incorporating advanced technological tools in EAP education. The strategies discussed herein aim to enhance the learning experience, cater to the diverse needs of students in multidisciplinary fields, and facilitate the development of intercultural competence, as emphasized by Arnó-Macià and Aguilar-Pérez. The integration of computer-assisted technologies in EAP modules is crucial for meeting the evolving demands of professional development in a globalized academic context.

7.1 Adaptive Learning Systems

Leveraging adaptive learning technologies can offer personalized learning experiences to EAP students. These systems use algorithms to analyze students' learning patterns and adapt the content accordingly. For instance, a student struggling with academic writing conventions can receive targeted exercises on this aspect, while another proficient in writing but weak in oral skills can be provided with speaking modules. This individualized approach not only caters to the specific needs of each learner but also optimizes learning efficiency.

7.2 Collaborative Online Platforms

The utilization of collaborative online platforms can enhance the development of communicative competencies in EAP learners. Platforms like Google Classroom or Moodle facilitate interactions among students and between students and instructors. These interactions can be in the form of peer reviews, discussion forums, and group projects, which are essential for developing the skills needed for multidisciplinary collaboration, as identified by Harvey and Stocks. Such platforms also support the inclusion of diverse linguistic and cultural perspectives, contributing to the development of intercultural competence.

7.3 Automated Feedback Tools

Implementing automated feedback tools for language learning, such as Grammarly or Turnitin, can significantly aid students in refining their academic writing and research skills. These tools provide instant feedback on grammar, syntax, and even plagiarism, thus allowing students to self-correct and learn from their mistakes in real time. This immediate feedback is crucial for non-native English speakers in EAP programs, as it accelerates their learning curve and enhances their language processing capabilities.

7.4 Multimedia Content Integration

The incorporation of multimedia content into EAP modules can address various learning styles and preferences. Interactive videos, podcasts, and webinars can make learning more engaging and effective. For example, video lectures on academic writing styles or webinars conducted by experts in different academic fields can provide practical insights and real-world examples, bridging the gap between academic learning and professional application.

7.5 Virtual Reality (VR) and Augmented Reality (AR) for Immersive Learning

VR and AR technologies can create immersive learning experiences, especially for students in fields requiring a high degree of spatial understanding or practical application. For instance, VR can simulate a conference setting where students can practice their presentation skills. Similarly, AR can overlay textual information onto real-world objects, aiding in the development of contextual language skills.

In conclusion, the strategic incorporation of computer-assisted technologies in EAP modules is paramount for addressing the diverse and evolving needs of learners in non-English-speaking countries. These technologies not only facilitate personalized and efficient learning but also prepare students for multidisciplinary, multicultural, and professional environments. As the academic landscape continues to globalize, the role of technology in EAP education becomes increasingly vital, ensuring that graduates are well-equipped with the necessary skills to thrive in their respective fields.

8. Empirical studies

Given the pivotal role of CALL mentioned above, there has been empirical researches that evidenced their benefits in language skills and knowledge as well as learner professional development in EAP modules. Previous studies on such systems as mobile learning, DIY corpora, and on-line writing system (Yeh 2015) have provided a starting point to reflect on the learning outcomes of CALL in EAP modules. However, many of these studies were only able to conduct quantitative analysis at the vocabulary level while neglecting the link between the acquisition of language skills and knowledge and learner professional development. The research design in Smith (2020) makes an exceptional case as it observes how learners are capable to construct a small specialist word list by their own, a skill possibly useful for their future work and how doing so has affected knowledge acquisition and participant satisfaction. Empirical evidence gathered from pre- and post-tests administered to 33 students in two hands-on classes, alongside 23 students in hands-off groups, in conjunction with perception questionnaires completed by 34 participants from the hands-on groups and 26 from the hands-off groups, demonstrates that interventions such as creating a corpus using files sourced from Moodle, expanding said corpus to encompass vocabulary extracted from the World Wide Web, studying word lists, compiling a vocabulary portfolio in Excel, and engaging in a vocabulary quiz, contribute to enhanced domain-specific vocabulary acquisition and facilitate a positive learning experience.

9. Conclusion

In this review study, the role of computer assisted technologies in learning EAP modules was thoroughly discussed. Furthermore, the benefit of computer assisted technologies in language knowledge and skills as well as professional development for the learners has been illuminated with theoretical and empirical evidence. Based on the evidence, it can be inferred that computer assisted technologies have a positive effect on learner professional development. However, how computer assisted technologies are beneficial to the future professional development of the students has been under-investigated by previous literature. In this sense, this study can shed light on what further studies are needed to further explore the relationship between computer assisted technologies and learner professional development, as it is made possible by the application of technology-based classrooms in an increasingly internationalized academic community during and after COVID-19. Therefore, there is room for further investigation to explore the link between computer-assisted technologies and language learning applicable in specific professional contexts that evolve around the ongoing challenges.

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