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Impacts and Challenges of a Mobile App for Improving Final-Year Project Proposal Writing: A Case from a Hong Kong University

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Abstract: Despite recognition of their characteristics of flexibility, mobility, and easy accessibility, the use of mobile devices in higher education is still in its early stages, with few focusing on essay writing. This chapter presents the initial data collected from students piloting an inter-institutionally developed mobile app, Capstone Ninja, for improving their final-year project proposal writing and managing their project schedule. Highlights of the project findings have been detailed in Chapter 5. This chapter focuses on results from pre- and post-app launch interviews which revealed that students were very positive towards the management tool, as it helped them to monitor various schedules easily, whereas their feedback on the learning content was varied. Factors with respect to students' readiness of adoption of the app for learning, their attitude towards this mode of learning, their language proficiency level, and the limitations of the app are explored.

Keywords: mobile learning, mobile app, textual analysis, browse behaviour, final-year project proposal

The increasing ubiquity and accessibility of mobile devices and the wide access to networks globally have encouraged and enabled the development of mobile learning (hereafter referred to as *m-learning*) in education. M-learning refers to "learning across multiple contexts, through social and content interactions, using electronic devices" (Crompton, 2013, p. 4). While m-learning has been studied and applied in education for over two decades, "there is still relatively little knowledge available, especially regarding the use of mobile technology in higher education setting(s)" (Pimmer et al., 2016, p. 492). Given that the largest demographic of mobile device users

is 18–29-year-olds, which is also the typical age of college students (Pew Research Center, 2019), it is worth examining the use of this technology among tertiary students. In addition, most m-learning in English focuses on individual language items such as vocabulary, grammatical items, and sentence structure. As shown in Chapter 5, recent research has started to explore the use of a mobile app for enhancing students' capstone project writing.

This chapter presents the initial findings on the use of the mobile app Capstone Ninja by electronic and information engineering students in a Hong Kong university to enhance their project proposal writing, a genre different from that focused upon in the previous chapter. It predominantly aims to explore the effectiveness of the app by studying the correlation between its use and the resulting quality of student writing, using both qualitative and quantitative data. Overall, the project is expected to contribute to our understanding of mobile education in improving students' writing, and students' perceptions of such learning and of mobile app devices.

English Education in Hong Kong Universities

Most tertiary institutions in Hong Kong have adopted English as the medium of instruction, despite the fact that Chinese is used predominantly in students' daily lives (e.g., Evans, 2017; Li, 2009). This is the situation in the authors' university. Nearly half of the freshmen in our university come from Chinese-medium secondary schools and may take a year to adapt to the change in language of instruction (Evans & Morrison, 2018). During their four years of study, students usually take two courses in English for academic purposes (EAP) in Year One and/or Year Two. These courses help equip them with general academic writing and speaking skills needed for their university studies. Between years two and four, students take one more English course of one to three credits which focuses on the language skills needed for their disciplinary study or future profession.

Students are required to complete a capstone/final-year project in the last stage of university education, which accounts for three to nine credits of the total 120-credit degree requirement in their undergraduate studies. They may not receive language support to prepare for their final-year project writing; this is particularly the case for those from the engineering programmes due to their packed curricula. Research in the U.S. university system suggests that students may not transfer the academic English skills learnt in their junior year to the disciplinary subjects in their senior years (Horner, 2014). Therefore, additional language support is important for these engineering students.

Mobile Learning in Higher Education

The pedagogical value of mobile and ubiquitous learning has been studied from several perspectives: in formal education settings (e.g., Frohberg et al., 2009), in work-based environments (e.g., Pachler et al., 2013), and in lifelong learning contexts (e.g., Alina-Mihaela, 2015). The themes examined vary widely, focusing on factors such as educational levels, contexts, subject matter domains, types of mobile devices, learning theories, and geographic distribution.

Mobile devices are characterised by distinguishing attributes such as portability, mobility, connectivity, and individuality (Sung et al., 2016). They provide very considerable potential for improving university students' learning experience and for solving some of the problems students and teachers face in higher education contexts (Wang & Cui, 2016). Their use can increase student autonomy and improve teacher-student interaction if they are integrated well with instructional strategies and pedagogy (Wang & Cui, 2016). This is especially helpful to Chinese students, as they tend to be quieter and more passive in learning, simply following teachers' instructions and teaching in the classroom (Ho, 2001). Some researchers therefore foresee that mobile technologies may radically transform higher education by offering new strategies and resources to enable "pervasive, personal, and connected learning" (Wagner, 2005, p. 43).

Research into m-learning in university education focuses on several areas. Most attention is placed on its impact on students (Crompton & Burke, 2018). Qun Wu (2015) developed a mobile app for students to learn English vocabulary. His results show that students who used this programme significantly outperformed those in the control group in acquiring new vocabulary. Learning vocabulary in this way is regarded by students to be innovative and creative (Agca & Ozdemir, 2013). Zhi Li and Volker Hegelheimer (2013) employed a web-based mobile application, Grammar Clinic, in an ESL writing class for one semester. Their analysis indicates a reduction in errors in final drafts as a result of the gains evidenced in a grammar post-test.

Another important area examined is students' and teachers' perceptions of m-learning (Crompton & Burke, 2018). Some studies have explored the more general views on its use for collaborative learning and communication (see for instance, Kim et al., 2013 and Zou & Yan, 2014, among others). Mohamed Sarrab (2015) analysed in detail science and engineering students' knowledge, acceptance, and use of m-learning. He found that they welcomed the idea of reading an article, submitting their assignment, and setting an assignment reminder using a mobile device. Others are interested in finding out learners' expectations on usage intent, ease of use, and

perceptions of the types of mobile devices and applications, as well as the language skills they aim to improve (Fucekova & Metruk, 2018; Hyman et al., 2014). Understanding students' attitudes towards the use of hand-held devices as educational tools is important for informing researchers of their behaviour when engaging in this type of learning. If users view m-learning as having little value, they will be less motivated to engage in the relevant activities (Crompton & Burke, 2018). Thus, one effective measurement of the value of mobile technology in an educational setting is to examine its usability by students in this situation (Swanson, 2018). In addition to finding out perceptions of students, research also shows teachers' positive evaluations regarding the use of m-learning in higher education (Al-Emran et al., 2016) and its value in stimulating interactions between teachers and students (Dascalu et al., 2014).

It is also essential to understand the factors and variables that impact the use of m-learning and its effectiveness for successful implementation. The use of mobile devices has been the central focus of research in m-learning. Chun Lai (2013) examined the factor of self-management, and Ibrahim Arpaci (2015) investigated the influence of culture on mobile learning adoption. It has been argued that the most important factor for the success of m-learning in higher education is the adoption of a model that can integrate the understanding of teaching and learning simultaneously (Alrasheedi et al., 2015). This is shown in Thomas Cochrane and David Rhodes' (2013) reiterative study in which impact of student learning is noted in the pedagogical integration of the mobile technology into a course and assessment.

This chapter addresses the major concerns expressed by the students and supervisors about the appeal and effectiveness of Capstone Ninja in helping students' writing. It considers the mobile app design, the language content, and impact on writing performance as a result of student login activities. Finally, it explores factors that may influence their adoption of the mobile app as well.

Research Objective

The research project, entitled "Language Enhancement for Capstone Projects Using Interactive Apps," is government-funded, involves five participating universities, and is expected to be completed by August 2021 (Chen et al., 2018). It aims to enhance the English communication competence students need for completing their project proposals, interim reports, and final-year project (FYP) reports, as well as the skills they require to verbally present the report results. To achieve these aims, the project has been developing a

mobile app called Capstone Ninja, which has multimodal English learning resources, a learning tool, a management tool, and a communication tool for students to communicate with their supervisors. The design is based on the underlying belief that an app should be flexible and able to tailor learning content to individual students. It provides supplementary language support to students who lack formal language input, with a focus on the speaking and writing necessary for completing an FYP report. It also aims to facilitate communication between the supervisor and the supervisee, which may not be effectively achieved using traditional emails. The first version of the app has already been developed and is available for download in the Apple App Store and the Google Play Store.

This chapter discusses the initial findings collected from the early adopters after they tried out the first version of the mobile app. In particular, the data analysis aims to examine whether the app can (1) enhance engineering students' English communication competence needed for completing their FYP proposal and (2) help them to manage their schedule using the management tool.

Research Questions

This study aims to answer the following questions:

1. What are students' opinions on the design and content of the learning tool and the management tool of the app?
2. What are the supervisor's views on the design and functions of the mobile app?
3. Is there a significant difference in the quality of students' final-year project proposal writing which can be attributable to the use of the mobile app?

Methods

A mixed methodology was used in this research study, involving the collection of both quantitative and qualitative data. The first type of quantitative data indicated the improvement in students' proposal writing after the use of the mobile app compared with before. This was measured in terms of the number of rhetorical moves in the writing, including the abstract, study background, literature review, objectives, research methods, project timetable, and bibliographic references. The second type examined student login and active time spent on the app during the writing period. The qualitative data included the pre- and post-app launch interviews with students. Post-app launch

interviews were also conducted with the supervisor and the language assessor, who was previously a university language teacher.

Participants

A total of six students and a supervisor from an engineering programme voluntarily participated in this trial. The students were in their final year of study, and the supervisor, who is the co-author of this chapter, is experienced in FYP supervision. This stage of the study lasted around two months, and students were encouraged to use the mobile app for self-learning and time management. The number of users is expected to increase substantially when the app is fully developed (Chen et al., 2018).

Other studies have evaluated mobile applications with a small number of subjects. For example, five adult users were invited to assess the usability of a mobile handwriting application (Yilmaz & Durdu, 2015); three participants were observed in their use of an iPad app (Tavernier, 2016); and two students' first drafts, self- and peer- feedback, and final drafts were analysed when examining the effectiveness of Google Docs (Woodard & Babcock, 2016). To increase the reliability of the results obtained with a small sample, the current study adopted triangulation methods for data collection.

Functions of the Mobile Learning App

The trial mobile app comprised two available functions:

1. The *learning tool* provides general and discipline-related English language resources for different types of FYP-related writing and the oral presentation. The language resources contain information that guides students regarding the rhetorical moves needed in their writing, referencing skills and language features typical in writing.
2. The *management tool* enables students to keep track of deadlines from different parties (department, supervisor, and themselves) and helps them to monitor their schedules.

The third function, a communication tool, is being developed and will be available to users in the next stage of the project. It provides a platform for the supervisor to communicate with the supervisee in real time and for students to communicate with their peers (in the case of a group project). The app is available for download from the Apple App Store and the Google Play Store. Figure 6.1 shows a screenshot of the two main functions available for the trial use and the third function, which is being developed.
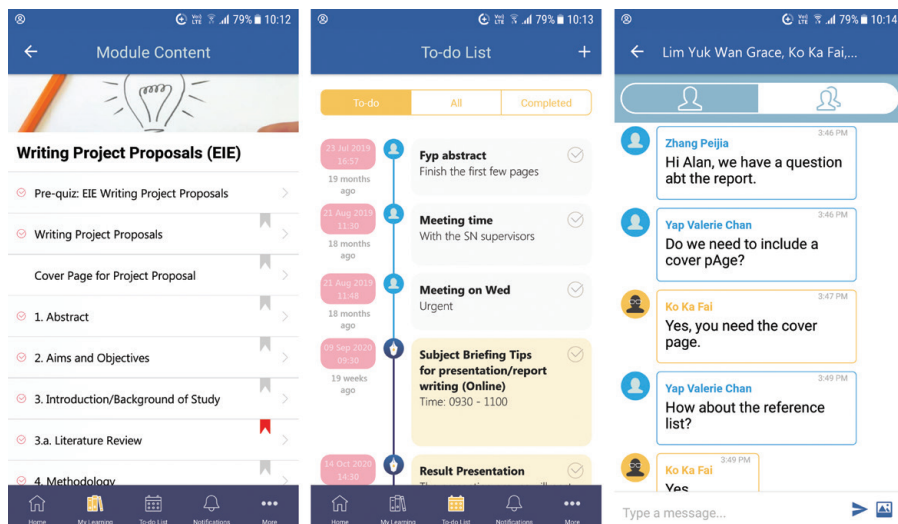
Figure 6.1. Screenshot of three functions of Capstone Ninja

To develop the content for the learning tool, the language team from the authors' university conducted textual analysis on previous students' project proposal writing. Reference was also made to the host department's guidelines on proposal writing; these list the main sections to be included, such as the objectives, introduction/background, method, project schedule, and references. Additional advice was solicited from the participating supervisor, who shared his perceptions of the students' weaknesses and strengths in writing and his views regarding what he felt should be the focus of the project. Finally, the language team incorporated the different ideas and developed the content for the learning tool of the mobile app. The initial design of the management tool was suggested by the students and supervisors in the pre-app survey, while the information for the schedule was provided by the department.

Procedure

Student interviews were conducted before and after they had used the app. The pre-interview was conducted in September 2018 in the first meeting in which the supervisor briefed his six supervisees. These students were asked in a short interview to share their usage intent and attitude toward apps for learning and for social networking. Immediately after this, they were invited to log onto the mobile app, complete the pre-quiz, browse the site, and comment on six areas—app features, app design, to-do-lists, learning modules, chat, and readiness to use the app for FYP writing.

A pre-quiz was administered before students were allowed to read the content; the post-quiz contained the same questions as the pre-quiz but in a shuffled order. Both quizzes asked users to indicate their confidence level for the option chosen. The post-quiz evaluated students' understanding of content and language use in proposal writing. The results revealed that students' language use and knowledge of proposal writing were generally satisfactory, as two-thirds of them answered two questions out of five correctly. All six students attempted the pre-quiz in the briefing, as it was administered in the class, whereas the post-quiz was completed by four students in their free time when they finished reading all the content in this module. Post-interviews were conducted in November 2018 after the proposals were submitted. Three students were available for the interview.

Textual analysis of the six pre-proposals (from the previous year) and post-proposals was conducted by a former English teacher to identify language and writing problems. The results were verified with another experienced language teacher; their inter-reliability ratio was found to be 90 percent. Any disagreement was resolved through negotiation. The qualitative results of the rhetorical moves of the proposals were further processed to identify whether there were similarities or differences in the rhetorical moves in writings after the use of the mobile app. Finally, each student's browse data over the two-month period were retrieved.

The findings from the interview results, quality of student writing, and students' mobile app usage rates are discussed below.

Results and Discussion

This section discusses and examines four types of collected data: (1) perceptions and attitude of students and their supervisor toward the design and application features of the mobile app, (2) number of rhetorical moves in the pre- and post-project proposals analysed by a language teacher, (3) supervisor's and language teacher's evaluation of writings, and (4) students' app browse data.

Comments on Mobile App Design and Functions

Pre-Launch Interview

All six students commented on the app design and applications in the interview. Their responses revealed a mixed attitude toward the use of an app for language learning. In their daily life, they used mobile apps for socialization and for entertainment. For improving English, they rarely used any app; nonetheless, they welcomed free apps such as Grammarly and Dictionary for

helping them to proofread essays or verify the meaning of words. A few liked using Sololearn as it enabled them to interact with other learners in virtual contexts, offered different levels of challenges, and even awarded them a certificate. The students were more willing to acquire subject knowledge using apps (e.g., Mimo) and pay for them as well.

Students found functions such as to-do-lists, chat, notification, and bookmark to be very useful. They expected the app to remind them of deadlines and wanted to use it to communicate with their supervisor. They also hoped that the app could synchronise with their phone calendar.

Students' views toward the proposal content were divided. One thought that the content was general and might not be relevant to his topic, whereas another appreciated the language support. They both rated the information on the proposal structure as helpful. However, they found the presentation of the learning unit for proposals unappealing owing to its lack of flexibility in letting them skip sections according to their interests and knowledge level. Similarly, their supervisor suggested that more interactive designs and features be implemented to increase its attractiveness.

Post-Launch Interview

Three of the participants attended the post-interview. All three evaluated the app's management tool favourably, as it allowed them to check the deadlines of their project schedule. One said, "I want(ed) to know what time to submit and when is the next deadline." All of them valued the tool that allowed them to set their own notifications before the deadlines for assignment submissions in the coming months. The students' evaluations of the content of the learning tool varied. All of them rated the information rather positively as "quite useful" and "helpful." They also thought that the app explained the organisation of the report well and provided "an overview and an idea on what to do." This is probably because it fills gaps in their understanding of writing, as the subject guidelines from their department provide little information on either the content or its structure.

However, the students seemed reluctant to spend more time on the app to improve their writing further, as indicated by their browse time within this period. There are a few possible reasons for this. One could be related to their perception of the educational potential of technological resources, a point discussed in Chun Lai and colleagues' (2012) study. The materials may not meet their needs fully.

One student indicated, "The materials are quite useful but I think maybe they are not for everyone. At least I don't feel like I need to read everything." This student's rating on the writing materials is positive but he did not seem

to be interested in all of them. His proposal content was rated highly by the supervisor, but the writing style and language were given a mid-range grade by the language teacher. He considered it unnecessary to write a detailed proposal at the early stage of the project as, according to the subject guidelines, the main emphasis should be on its technical information. The low weighting for writing (4% of the overall grade of the entire subject) may also demotivate students from making more of an effort in this regard. This echoes researchers' views that the use of technology is related to the demands of the study situations (Goodyear & Ellis, 2008).

Another student with a fairly good command of English looked for excellent samples of theses on his topic to guide him on writing objectives and developing a good theory. He targeted specific journal articles or A+ graded theses from online sources and was not interested in the app's information on project proposals. The last student used the app for "grammar improvement" but was frustrated at reading "so many English words in the small screen" as this made him feel "uncomfortable," and therefore, he was "not willing to use it." This remark confirmed earlier observations that users could develop a negative experience because of the limitations of the device or the ease of using the tools (Kim et al., 2013; Ting, 2012).

Overall, students' responses to the app were divided. While all were interested in the management tool, they expected more flexible and personalised content that would meet their individual needs. As noted by Mike Sharples (2000), the more the learning becomes student-centred and individualised, the better and more personalised the new technologies will become.

Rhetorical Moves of Proposal Writing

Six copies of pre- and post-intervention proposal writing were graded and textually analysed by the former language teacher. The analysis focused on two main areas: quality of rhetorical moves and referencing skills (e.g., in-text citations and bibliographical list). The rhetorical moves examined were the seven components recommended by the supervisor: abstract, study background, literature review, objectives, research methods, project timetable, and bibliographic references. Some of the sub-moves, for instance, statement of problem and research gap in the move of study background, were further interpreted. The quality of the pre- and post-proposal writing is reported and discussed below.

One way to objectively examine the impact of the mobile app is to analyse the changes in the number of moves in the students' writing after the intervention. In the pre-proposals completed in 2017, five students included six moves, with an embedded literature review in the introduction section

following the department guidelines, whereas only one proposal contained all the moves recommended in the mobile app. In the post-proposals written in 2018 after the app intervention, three students included all seven moves; this was in marked contrast to what was observed in the pre-intervention proposals in the previous year. Figure 6.2 summarises these findings.

Number of Moves in the Proposals
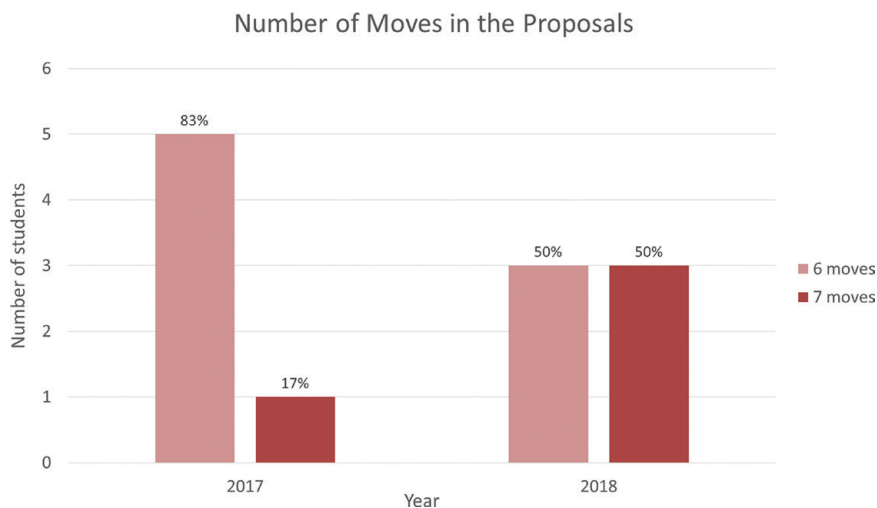
*Figure 6.2. Difference in number of moves in the
pre- and post-proposals in 2017 and 2018.*

As seen in Figure 6.2, three students included all the rhetorical moves in their proposals in 2018 compared with only one in 2017. This may suggest an improvement in the content of post-proposals, as two more students added the abstract section in their writing. These students are unlikely to have learnt about this from their supervisor or from the course guidelines, as both provided no input on proposal writing. They were very likely influenced by the app. The remaining three proposals that did not follow the rhetorical moves suggested were either graded low (C) or very outstanding in performance (A). The supervisor commented that the two weak proposals were very poorly written with little content, and poor organisation and referencing skills. An analysis of the browse time and student activities on the app showed that four students read the content a week before the submission of the proposal, and only three of them decided to incorporate the abstract section. This points to an individual student making a personal learning choice, and/or accepting ideas from the app and ignoring the supervisor's advice in order to make the entire proposal writing clearer and more comprehensive.

Other than the level of motivation to improve writing quality, there are two reasons for students' reluctance to adopt the app content as discussed in

the section on the pre-launch interview. Evidence from the browse activity indicates that the two students whose English is very good did not browse the site on proposal writing again after the first login in September during the briefing. They may regard the content as unimportant because it is not the official subject material, or as less authoritative compared with the subject guidelines from the department. In fact, both the project team members and their supervisor encouraged them to use the app, but they did not have to commit to it, as use of the app is optional and is intended for self-learning. Another reason could be related to students' level of English, which may affect their understanding of the materials and their subsequent use in improving their writing. It seems that if students' level of English and knowledge of writing are average, they are more motivated to browse the app. However, the extremely weak students may find the English texts on the app too challenging to read and apply in their writing. Because of the reasons discussed above, students may simply give reasons such as "heavy workload," "tight schedule," and "busy" for not browsing the app.

Feedback on Writing by Supervisor and Language Teacher

The language teacher and the supervisor marked the proposals using their own individual criteria. Therefore, their grades may not be fully comparable. However, it is interesting to note that both shared similar views in their grading and evaluation. Tables 6.1 and 6.2 show the final overall grades given to proposals written without and with mobile app support, respectively.

Table 6.1. Grades given to proposals written without mobile app support

Markers	Performance of proposals written without app support					
	Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6
Supervisor	A	A	B+	B+	C	B+
Language teacher	B+	B+	C+	B	C	B

Table 6.2. Grades given to proposals written with mobile app support

Markers	Performance of proposals written with app support					
	Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6
Supervisor	B	B+	C	A	B	C
Language teacher	B	B	C+	B+	C+	B

The language teacher and supervisor gave similar grades to most pre- and post-proposals. As shown in Tables 6.1 and 6.2, the grades for the five pre- and post-proposals were very comparable, with half a grade difference at most. Both markers graded pre-proposals one and two high, and pre-proposal five low; however, they varied greatly in their grading on pre-proposal three. Five post-proposals (one to five) were given similar grades. The supervisor gave a wider spread of grades, ranging from C to A, whereas the language teacher gave a narrower range (C to B+). In the authors' university, A+/A/B+ are generally regarded as high, B, as average, and C/C+ as low grades by both the faculty members and the language teachers. It seems that the quality of writing of pre-proposals is better, as higher grades were given overall compared with the post-proposals. According to the supervisor, the students that he supervised the previous year were more motivated and demonstrated a better attitude toward learning. The grades illustrate that the two colleagues' marking seems to align generally even though different criteria were adopted.

The language teacher and supervisor emphasised different aspects of writing when rating the proposals. In general, the supervisor viewed content (e.g., originality of research idea, objectives, research design) to be of primary importance, whereas the language teacher focused on the writing style, rhetorical moves, and quality of in-text citations and referencing skills. This may explain the wide difference in the grades of pre-proposal three and post-proposal six. Pre-proposal three presented a good project idea, although the language and referencing skills were rather weak. By contrast, post-proposal six had a weak project idea and method, but contents were well-organised with appropriate referencing.

It is noteworthy that the supervisor also shared the concerns of the language teacher on the writing style (e.g., logical flow of ideas), organisation of information (e.g., lack of section title, poor use of paragraphs), and the quality of references when evaluating student writing. He further commented that these language problems would affect the final grade of the writing owing to the poor impression they create. The language teacher further noticed that students ignored the logical sequence in presenting the information suggested in the app, with almost all students stating the objectives in the first few lines of the proposals without discussing the background information/problem first. This may lead to readers' difficulty in understanding the development of the project motivation and thereby eventually affect its persuasiveness.

Feedback on Students' Referencing Skills from Language Teacher

Students were advised by the department to cite references properly to avoid plagiarism. However, the language teacher's textual analysis revealed

that a substantial number of cited ideas were not acknowledged and that there were inaccuracies in the in-text citations and reference lists. While citations may be satisfactorily presented in well-written proposals, average and poorly-written ones contained a substantial number of unacknowledged texts: e.g., "VLC is an optical wireless communications technology, it carries information by modulating light in the visible spectrum (400nm to 700nm)."

In-text citations were often inaccurate in most proposals and contained grammatical mistakes and problems in the format as indicated by the underlined expressions in this example: "She et al. designed to implement of two Bayesian estimators, namely Kalman filter (KF) and particle filter (PF) to continuously track the trajectory of a moving person [2]." There were other citation problems, including the absence of an in-text citation for a reference listed in the bibliographic references, the inclusion of an in-text citation in the overview of writing, and the absence of a page number in a direct quotation in the APA referencing style. The reliability of the references used can also be an issue. Students cited information from Wikipedia, a non-academic source, thus ignoring the advice given on the app and by their supervisor.

Conclusion and Implications for App Design for Language Learning

This chapter presents the initial feedback from engineering students and their supervisor on the use of the trial version of the Capstone Ninja mobile app. Two functions are available at this stage: the learning tool and the management tool. While students' feedback on the management tool was very positive, feedback on the learning tool content and the app features was divided. Generally, some valued the useful guidance on proposal content, whereas others looked for richer language resources and personalised experiences of use. The app could be more attractive in its features and content.

To meet the genuine need for communication between the supervisor and supervisee, the project team has developed a chat function that enables them to communicate with each other in real time. Additional writing tips for weaker/sophisticated learners have been added to cater to different levels of writing skills among them and expectations in writing quality. The usability of the app has also been improved by enabling learners to pick and choose content to read with a tap icon. Instead of accessing two different electronic devices like before, students only need to login on the app, following which they can read the subject guidelines, contact their supervisor(s), and learn the proposal writing tips all on one device. In addition, some features such as

data analytics based on usage conditions are now available fully for helping the project team members to generate a better understanding of the correlation between app usage and students' FYP performance. Finally, gamification based on the learning progress and user scores will be included in the app to increase the interest level in the app. Although the app is tailor-made for FYP writing, the entire design can be adapted for subjects that aim to provide a learning tool, a management tool, and a communication tool between the teacher(s) and the students owing to its easy operability and universality.

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References

Agca, R. K., & Ozdemir, S. (2013). Foreign language vocabulary learning with mobile technologies. *Procedia–Social and Behavioural Sciences*, *883*, 781-785.

Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human Behaviour*, *56*, 93-102.

Alina-Mihaela, I. (2015). Mobile technologies for lifelong learning. *Informatica Economica*, *19*(2), 112-119.

Alrasheedi, M., Capretz, I. F., & Raza, A. (2015). A systematic review of the critical factors for success of mobile learning in higher education (University students' perspective). *Journal of Educational Computing Research*, *52*(2), 257-276.

Arpaci, I. (2015). A comparative study of the effects of cultural differences on the adoption of mobile learning. *British Journal of Educational Technology*, *46*(4), 699-712. https://doi.org/10.1111/bjet.12160

Chen, J., Lim, G., Robbin, J., & Yap, V. (2018, December). *Can a mobile app help students write better final year project proposals?* [Paper presentation]. The 2nd International Conference on English Across the Curriculum, Hong Kong.

Cochrane, T., & Rhodes, D. (2013). iArchi[tech]ture: Developing a mobile social media framework for pedagogical transformation. *Australasian Journal of Educational Technology*, *29*(3), 372-386.

Crompton, H. (2013). A historical overview of mobile learning: Towards learner-centred education. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning* (pp. 3-14). Routledge.

Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers & Education*, *123*, 53-64.

Dascalu, M. I., Bodea, C. N., Lytras, M., De Pablos, P. O., & Burlacu, A. (2014). Improving e-learning communities through optimal composition of multidisciplinary learning groups. *Computers in Human Behaviour*, *30*, 362-371.

Evans, S. (2017). English in Hong Kong higher education. *World Englishes*, *36*(4), 591-610.

Evans, S., & Morrison, B. (2018). Adjusting to higher education in Hong Kong: The influence of school medium of instruction. *International Journal of Bilingual Education and Bilingualism*, *21*(8), 1016-1029.

Frohberg, D., Göth, C., & Schwabe, G. (2009). Mobile learning projects. A critical analysis of the state of the art. *Journal of Computer Learning*, *25*, 307-331.

Fucekova, M., & Metruk, R. (2018). Developing English skills by means of mobile applications. *Information Technologies and Learning Tools*, *66*(4), 173-185.

Goodyear, P., & Ellis, R. A. (2008). University students' approaches to learning: Rethinking the place of technology. *Distance Education*, *29*(2), 141-152.

Ho, I. T. (2001). Are Chinese teachers authoritarian? In D. A. Watkins & J. B. Biggs (Eds.), *Teaching the Chinese learner: Psychological and pedagogical perspectives* (pp. 99-114). CERC & ACER.

Horner, B. (2014). Writing in the disciplines/Writing across the curriculum. In C. Leung & B. Street (Eds.), *English for academic purposes* (pp. 405-418). Routledge.

Hyman, J. A., Moser, M. T., & Segala, L. N. (2014). Electronic reading and digital library technologies: Understanding learner expectation and usage intent for mobile learning. *Educational Technology Research Development*, *62*, 35-52.

Kim, D., Rueckert, D., Kim, E. J., & Seo, D. Y. (2013). Students' perceptions and experiences of mobile learning. *Language Learning & Technology*, *17*(3), 52-73.

Lai, C. (2013). A framework for developing self-directed technology use for language learning. *Language Learning & Technology*, *17*(2), 100-122.

Lai, C., Wang, Q., & Lei, J. (2012). What factors predict undergraduate students' use of technology for learning? A case from Hong Kong. *Computers & Education*, *59*, 569-579.

Li, D. C. S. (2009). Towards 'biliteracy and trilingualism' in Hong Kong (SAR): Problems, dilemmas and stakeholders' views. *AILA Review*, *22*(1), 72-84.

Li, Z., & Hegelheimer, V. (2013). Mobile-assisted grammar exercises: Effects on self-editing in L2 writing. *Language Learning & Technology*, 17(3), 135-156.

Pachler, N., Pimmer, C., & Seipold, J. (2013). Work-based mobile learning: An overview. In N. Pachler, C. Pimmer, & J. Seipold (Eds.), *Work-based mobile learning: Concepts and cases* (pp. 1-48). Peter Lang.

Pew Research Center. (2019, June 12). *Mobile fact sheet*. http://www.pewinternet.org/fact-sheet/mobile/

Pimmer, C., Mateescu, M., & Gröhbiel, U. (2016). Mobile and ubiquitous learning in higher education settings: A systematic review of empirical studies. *Computers in Human Behaviour*, *63*, 490-501.

Sarrab M. (2015). IETC 2014. M-learning in education: Omani undergraduate students' perspective. *Social and Behavioural Sciences*, *176*, 834-839.

Sharples, M. (2000). The design of personal mobile technologies for lifelong learning. *Computers and Education*, *34*, 177-193.

Sung, T., Chang, K., & Liu, T. (2016). The effects of integrating mobile devices with teaching and learning on student learning performance: A meta-analysis and research synthesis. *Computer Education*, *94*, 252-275.

Swanson, J. N. (2018, July). Assessing the effectiveness of the use of mobile technology in a collegiate course: A case study in M-learning. *Technology, Knowledge and Learning*, 25, 389-408 (2020). https://doi.org/10.1007/s10758-018-9372-1

Tavernier, M. (2016). Exploring the suitability of the book creator for iPad app for early childhood education. In D. Churchill, J. Lu, & T. K. F. Chiu (Eds.), *Mobile learning design: Theories and application* (pp. 249-270). Springer.

Ting, Y. L. (2012). The pitfalls of mobile devices in learning: A different view and implications for pedagogical design. *Journal of Educational Computing research*, *46*(2), 119-134.

Wagner, E. D. (2005). Enabling mobile learning. *EDUCAUSE Review*, *40*, 41-52.

Wang, Z., & Cui, Y. (2016). Mobile-assisted language learning in China's College English Education: The reality and research. In D. Churchill, J. Lu, & T. K. F. Chiu (Eds.), *Mobile learning design: Theories and application* (pp. 335-381). Springer.

Woodard, R., & Babcock, A. (2016). Designing writing tasks in Google Docs that encourage conversation: An inquiry into feedback and revision. In V. X. Wang (Ed.), *Handbook of research on learning outcomes and opportunities in the digital age* (pp. 1-29). IGI Global. https://doi.org/10.4018/978-1-4666-9577-1

Wu, Q. (2015). Designing a smartphone app to teach English (L2) vocabulary. *Computers & Education*, *85*, 170-179.

Yilmaz, B., & Durdu, P. O. (2015). Heuristic evaluation of a mobile hand-writing learning application. In *2015 9th International Conference on Application of Information and Communication Technologies (AICT)*, (pp. 549-552). IEEE. https://doi.org/10.1109/ICAICT.2015.7338621

Zou, B., & Yan, X. (2014). Chinese students' perceptions of using mobile devices for English learning. *International Journal of Computer-Assisted Language Learning and Teaching*, *4*(3), 20-33. https://doi.org/10.4018/ijcallt.2014070102