Abstract

In twenty-first (21st) century tertiary education, undergraduate study is intended to not only to teach the subject knowledge through direct instruction or lecturing, but also to cultivate and foster students’ skills and literacies to suit societal needs. For this reason, it is increasingly important to introduce new teaching and learning (T&L) strategies and web applications (apps) into students’ undergraduate study. The introduction of collaborative inquiry learning (CIL) is intended to enhance students’ communication and collaboration skills throughout their learning. In addition, by introducing social annotation (SoAn) tools, students are able to bookmark, highlight, annotate, share, discuss, and collaborate on information sources collected by students for their collaborative inquiry learning assignments (CILA).

In this study, a self-developed SoAn tool known as the Web Annotation and Sharing Platform (WASP) was introduced to investigate how the SoAn tool can facilitate students’ CIL. The study included 377 students (freshmen or sophomores) from three different courses at a Hong Kong University, Hong Kong Christian University. A mixed-method research approach was employed using four data collection methods. Quantitative data were collected from all participating students through a questionnaire survey, WASP log file (students’ actions on WASP), and CILA marks. Furthermore, qualitative data were gathered from selected students in individual face-to-face interviews. The study aimed to ascertain how students integrate and use the SoAn tool in their CIL. This study also investigated whether students think a SoAn tool is useful and effective for their CIL. Moreover, this study examined the correlations between students’ perceptions of CIL and WASP, usage of WASP, and their CILA mark. Finally,
this study examined the challenges students encountered when they integrate and use WASP in their CIL.

The results reveal that the integration and usage of a SoAn tool were concentrated in the early stages of students’ CIL. Furthermore, the results illustrated how the ‘able other (s)’ arise in the CIL group to provide information sources that initiate the discussion and collaboration among group members. Based upon the student perceptions collected in this study, the results suggested that students agreed that the WASP functions were useful and effective for CIL in courses that teach elementary Information and Communications Technology knowledge content (ICT-related courses). Moreover, student perceptions on the WASP functions highly correlated with their perceptions of CL before this study and any respective group process experiences. The results also indicated that students’ perceptions, SoAn tool usage and learning outcomes (CILA mark) are not correlated, there is a higher chance of reaching correlation between the perceived usefulness of the WASP functions and their CILA mark in ICT-related courses. Lastly, the results suggested that low motivation for learning and using a SoAn tool, the functionality and recognition of a SoAn tool, and methods of processing, discussing, and collaborating on collected information sources were the challenges encountered when students integrate and use a SoAn tool in their CIL.

The implications and limitations of this study are discussed in Chapter 8. Directions for future research and suggestions are provided, which includes introducing SoAn tools in ICT-related courses and enhancing the functions of SoAn tools both for better user experiences and research purposes.
# Table of Contents

DECLARATION............................................................................................................. i
Abstract .......................................................................................................................... ii
Acknowledgments......................................................................................................... iv
Table of Contents ........................................................................................................... v
List of Tables.................................................................................................................. x
List of Abbreviation ..................................................................................................... xv

Chapter 1. Overview of the Study ........................................................................... 1
  1.1. Chapter Overview ........................................................................................ 1
  1.2. Introduction .................................................................................................... 1
  1.3. The Research Rationale ................................................................................. 6
      1.3.1. Required 21st century skills for university graduates ...................... 6
      1.3.2. Turning point to ease collaborative inquiry studies in Hong Kong ...... 7
      1.3.3. Expected high ICT literacy for university graduates ...................... 9
  1.4. Research Questions and Hypotheses ........................................................... 10
  1.5. Research Approach and Methodological Framework .................................. 12
      1.5.1. The choice of research approach ..................................................... 12
      1.5.2. The research methods ...................................................................... 13
      1.5.3. The research context ...................................................................... 13
  1.6. Overview of the Thesis ................................................................................ 16

Chapter 2. Students’ Learning at Hong Kong University ...................................... 18
  2.1. Chapter Overview ........................................................................................ 18
  2.2. Introduction of 21st Century Skills ............................................................... 18
      2.2.1. Communication skills and collaboration skills ............................ 19
      2.2.2. Information literacy and ICT literacy ........................................... 22
  2.3. The cultivation of 21st century skills in the Hong Kong education system .26
      2.3.1. The cultivation of skills in primary and secondary education ..........26
      2.3.2. The cultivation of skills in Hong Kong universities .................... 31
5.1. Chapter Overview .......................................................................................... 113
5.2. The Research Context .................................................................................. 113
5.3. The Research Processes .............................................................................. 115
  5.3.1. Site, course and interviewee selection ............................................... 115
  5.3.2. Preparations for students’ CILA .......................................................... 123
  5.3.3. Work on the course CILA .................................................................. 128
  5.3.4. Data collection in each cycle ............................................................. 128
  5.3.5. The role of the researcher ................................................................. 132
  5.3.6. The research process flowchart .......................................................... 134
5.4. The Research Method .................................................................................. 139
  5.4.1. Mixed-method approach .................................................................... 139
  5.4.2. Data collection methods ..................................................................... 143
  5.4.3. Ethical Considerations ....................................................................... 158
  5.4.4. Data entry, cleaning and analysis ....................................................... 160
  5.4.5. Data validity and reliability ............................................................... 165
5.5. The Pilot Study ............................................................................................ 168
5.6. Chapter Summary ...................................................................................... 169

Chapter 6. Results of the study ........................................................................ 171
6.1. Results of quantitative data collection ....................................................... 171
  6.1.1. Participant profile ............................................................................... 171
  6.1.2. Reliability Tests and Scoring ............................................................. 173
  6.1.3. Descriptive Statistics .......................................................................... 175
  6.1.4. Correlation between the SoAn tool and CIL ...................................... 191
6.2. Results of qualitative data .......................................................................... 196
  6.2.1. Participant profile ............................................................................... 196
  6.2.2. Self-reported usage of WASP and apps for CILA ............................. 198
  6.2.3. The integration and use of WASP in students’ CIL ........................... 200
6.3. Chapter Summary ...................................................................................... 215
Chapter 7. Discussion

7.1. Chapter Overview

7.2. Research questions of this study

7.2.1. How do students integrate and use the SoAn tool in their collaborative inquiry learning?

7.2.2. Do students believe the SoAn tool is useful and effective in their collaborative inquiry learning?

7.2.3. How do students’ perceptions, usage of the SoAn tool and learning outcomes in their collaborative inquiry learning correlate with each other?

7.2.4. What challenges do students encounter when they integrate and use the SoAn tool in their collaborative inquiry learning?

7.3. Chapter Summary

Chapter 8. Implications and Conclusions

8.1. Implications of the study

8.1.1. Theoretical implications of the study

8.1.2. Practical implications of the study

8.2. Limitations of the study

8.2.1. The low response rate of participants

8.2.2. No reminder to encourage the integration and usage of WASP throughout the learning process

8.3. Suggestions for further study

8.3.1. Introducing SoAn tools in different learning settings

8.3.2. Enhance the functions of SoAn tools for user experiences

8.3.3. Enhance the function of SoAn tools for research purpose

8.4. Conclusion

References

Appendix I. Frameworks on 21st century skills

Appendix II. Sample Page of WASP User Manual

Appendix III. Questionnaire Survey Informed Consent Form

Appendix IV. Questionnaire Questions
Appendix V: Individual Face-to-face Interview Informed Consent Form ..........283
Appendix VI: Individual Face-to-face Interview Information Sheet..................284
Appendix VII: Individual Face-to-face Interview Questions................................285
Appendix VIII: Grade scale of Hong Kong Christian University .......................289