Enhancing E-Learning Education with Interactive Software: A Summary Report [1]

利用互动软件加强网络学习教育

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THIS article is a summary report of a curriculum development and a research project conducted by the English Language and Literature Studies Programme, which employed an e-learning toolkit, called Articulate, to develop online interactive modules for 10 undergraduate courses of various subject disciplines, and investigated the practices and the perceived learning effectiveness of the online interactive modules in these courses. The major findings from student and instructor questionnaire surveys, student focus groups, instructor interviews, and iSpace (or Moodle) log data were briefly addressed. Finally, some practices for continually using or developing online interactive modules were suggested.

本文是英语语言文学专业开展的课程开发与研究项目的摘要报告，该项目使用电子学习工具包Articulate，为10个不同学科领域的本科课程开发在线互动模块，并调查了这些课程中的在线互动模块的实践和感知学习效果。本文简要介绍了学生和教师问卷调查、学生焦点小组、讲师访谈和iSpace（或Moodle）日志数据的主要分析结果。最后，提出了一些继续使用或开发在线互动模块的做法。

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Introduction

In response to the call for innovative integration of information and communication technology (ICT) into education in the 13th Five-Year Plan for ICT in education (MOE, 2016), the English Language and Literature Studies (ELLS) Programme, funded by the Department of Education of Guangdong Province's University Innovation and Enhancement Project, conducted a curriculum development and research project in 2018 on promoting the use of interactive software in enhancing students' learning experience and faculty's teaching effectiveness.

Online interactive resources and activities provided in iSpace or Moodle (an e-learning platform or a learning management systems), such as multiple-choice quizzes, drag-and-drop matching exercises, and flash card activities, have been viewed as active-learning instructional strategies to reinforce course concepts (MacKenzie & Ballard, 2015).

The aim of this semester-long project was to research, develop, and share ideas on how best to develop e-learning education with online interactive software. Faculty participants in the project designed and piloted learning modules using online interactive learning tools produced by a software company known as Articulate, while student participants engaged with the online modules as part of the instruction they received in the selected courses.

Objective

In the present study, online interactive modules were developed and implemented in 10 undergraduate courses of various subject disciplines (including seven ELLS major courses and three free-elective/interdisciplinary-foundation courses) during the second semester of 2017-2018. A comprehensive, mixed-methods analysis of instructors' perceptions and implementation, and students' perceptions and practice of these online interactive modules was conducted. The ultimate goal of this project was to identify sustainable and effective practices for developing and implementing online interactive materials that enhance student learning. This is important because it allows innovative e-learning materials to be trailed and evaluated before committing to wide-scale adoption (Hinkelman, 2018).

Major Findings

Students' Perceptions and Practices of the Online Interactive Modules Implemented in Their Classes

A questionnaire survey measuring students' acceptance of the online interactive modules was administered to the participating students in class, and students' iSpace log data concerning the frequencies of views of all online interactive modules throughout the semester were collected. Results indicated that students generally accepted online

modules to a moderate extent and viewed each online module six to seven times on average during the semester. Qualitative analysis of focus group discussions also revealed that students generally considered the modules effective learning tools, and they were particularly useful for assisting them in mastering the course content or skills, reviewing the course content, and self-assessment.

These online interactive modules could be in the form of repetition or extension of in-class concepts. Their lesson format could be in the form of instructional content presentations, quiz games, or a combination of both formats. Each module may contain one or more types of major interactive features, including multimedia (e.g., video files, audio files, and URLs to other websites), non-linear text displays (e.g., accordions, tabs, labelled graphics, and flash cards), and quizzes (e.g., drag-and-drop sorting, drag-and-drop matching, text entry, multiple choice, and multiple response). Some of these module features are illustrated in Figures 1–6, which are the screenshots of some modules created.

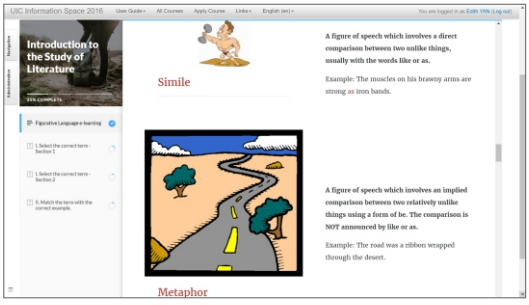

Fig. 1. Screenshot of an extension-of-in-class-concept module, in which vivid pictures are used to illustrate new course content.

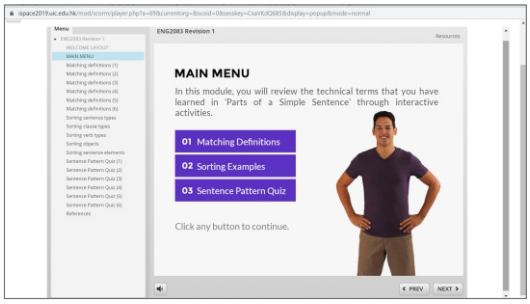

Fig. 2. Screenshot of the main menu of a quiz-game module.

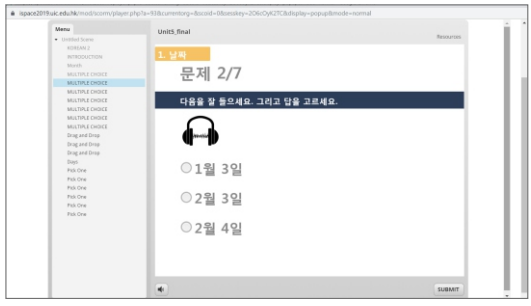

Fig. 3. An audio file, as indicated by the icon, embedded in a multiple-choice quiz item.

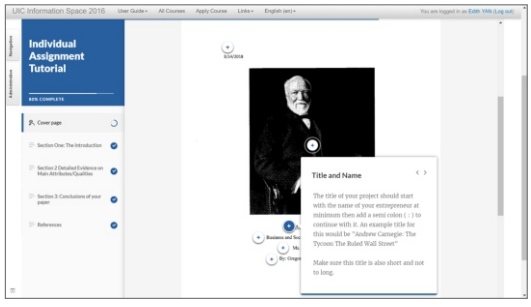

Fig. 4. Labelled graphics employed to introduce various parts of the cover page of an assignment.

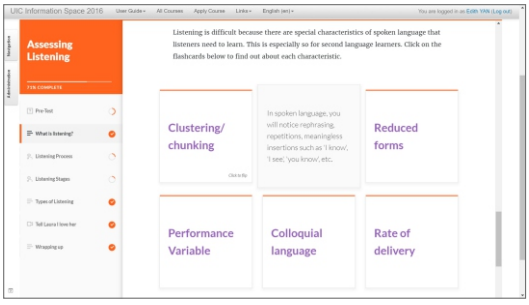

Fig. 5. Flash cards employed to introduce key terms and their explanations.

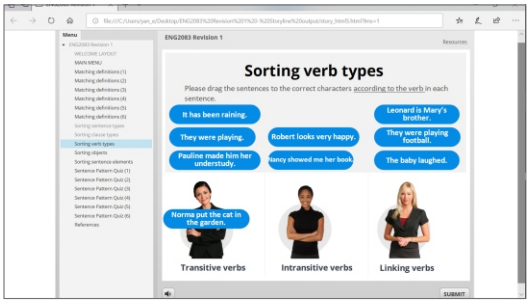

Fig. 6. Drag-and-drop sorting employed for classifying examples.

Quantitative analysis of the survey and iSpace log data indicated that online interactive modules in the form of a combination of instructional content presentations and quiz games and with high level of interactivity were accepted by the students to a greater extent and viewed by them more frequently. When a module is in the form of a combination of instructional content presentations and quiz games, it may provide key information for students' revision and serve as a self-assessment tool for checking their own progress, which were the two major functions given by the focus groups of effective online interactive modules. Modules with high interactivity levels were also identified by the focus groups as another major feature that engaged them to learn effectively.

On the other hand, statistical data showed that online interactive modules in the form of an extension of in-class concepts, when compared to those in the form of repetition of in-class concepts, were viewed more frequently but not accepted to a greater extent by the students. Focus group data suggested that students unable to print out the module content or make annotations might hinder them from mastering any new points presented in the module.

Instructors' Perceptions of Developing and Implementing Online Interactive Modules in Their Classes

Participating instructors were asked to complete a questionnaire measuring instructors' acceptance of developing and implementing the online interactive modules after they had finished the implementation in their classes. Then they were interviewed about how well they perceive the quality and use of the online interactive modules in their courses.

The data suggested that instructors tended to be cautious about further development and implementation of online interactive modules in their classes. According to the overall survey responses, instructors only accepted the

implementation of the online interactive modules to a very small extent. While their intention to continue developing and implementing the online modules was generally at a moderate extent, their perceived ease of creating and implementing the modules was at the range of neither agreeing nor disagreeing.

The instructor interviews gave varied responses about the benefits of the online interactive modules and often these benefits seemed more difficult for instructors to express, due to their uncertainty about the students' experiences. The main benefits mentioned were that the online modules provided an alternative way of conveying information, they could help ensure parity among course sections, they helped to free up class time, they were visually appealing, and the instructors gained technical skills.

The drawbacks of the online interactive modules were reported to be that they were time-consuming to create, there were several technological challenges and it was difficult for the instructors to determine their usefulness.

Conclusion

In the present study, student survey, focus group and iSpace log data suggested that online interactive modules in the form of a combination of instructional content presentations and quiz games, and with high level of interactivity might work better for enhancing students' autonomous learning. When online modules are used to introduce new concepts, some adjustments (such as, providing printable worksheets to guide students in jotting down the important points) might be needed for effective implementation.

On the other hand, instructor survey and interview data suggested that the instructors' intention of continually using or developing online interactive modules was moderately high, even though their responses concerning the perceived ease of use and the benefits of developing the online interactive modules were quite diverse.

In view of this, an incremental approach to creating and implementing the online modules focusing on gradual development of extended learning activities for students are recommended. Guidance in designing and implementing online interactive modules with appropriate technological orientation can be provided through experience sharing workshops.

Finally, as the modules were found to be valuable to ensure parity among course sections, well-constructed online interactive modules could be produced by a team and shared among several courses or several sections of a course in order to reap the benefits of efficiency and effectiveness of course materials development (Rossiter, 2013).

Acknowledgements

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The Project Report can be downloaded by UIC staff from https://dhss.uic.edu.hk/en/ells/research-reports.

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