Enhancing teaching and learning of Home Economics in secondary schools with wikis: An action research study

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Abstract. This article discusses an action research study using a wiki as a course platform for teaching and learning Home Economics in secondary schools. A secondary Home Economics teacher observed that dessert recipes were too wordy and that students generally felt bored and were not eager to read them in full. To improve his teaching effectiveness, the teacher attempts to investigate the use of a free wiki service (Google Sites) in order to supplement traditional classroom teaching and practice with online learning resources and activities. An action research approach is adopted in the study and the teacher tries to improve his teaching strategies to enhance interactions between the participants and improve students' learning outcomes. Furthermore, the teacher also attempts to integrate assessment activities with wiki-based learning activities to support students' learning in his class.

Keywords: Wiki, Web 2.0, Home Economics, peer assessment, self-assessment

Introduction

In recent years, Web 2.0 concepts have led to the development and evolution of many web-based communities and hosted services, including weblogs (blogs), wikis, podcasts, Really Simple Syndication (RSS), and social networking sites (O'Reilly, 2005). Research findings show that the social aspects of Web 2.0 have great potential for enhancing education (Boyd, 2007). Looking at the wiki footprints, Lai and Ng (2011) point out that students can master various skills such as ICT, collaboration, and organizational skills through wiki-based collaborative activities and peer learning.

Also, in view of the rapid development of Web 2.0 platforms, it is timely for teacher educators to lead schools in integrating IT into learning and teaching. This study is a response to a secondary Home Economics teacher's observation that dessert recipes were too wordy, meaning that his students were generally bored and reluctant to read them properly, which forced the teacher to spend a lot of time describing the procedure in class. To improve teaching effectiveness, the teacher attempted to use free wikis to supplement traditional classroom teaching and practice in making western desserts and pastries with online learning resources and activities. He used Google Sites, which is a free service provided by Google recommended by many technology writers as a tool for building collaborative websites for teaching and learning. An action research approach was adopted and the teacher tried to enhance interactions between participants and improve students' learning outcomes. Furthermore, the teacher also attempted to integrate assessment activities with the wiki-based learning activities to support students' learning in his class.

Literature review

The policy document "Information Technology (IT) for Learning in a New Era: Five-Year Strategy 1998/99 to 2002/03" was published in Hong Kong in November 1998, marking the beginning of the first phase of the structured development of IT in education. Ten years later, in the third phase of the program, the focus was changed to emphasize "the human factor rather than the technical factor" (Education Bureau, 2007).

Meanwhile, Web 2.0 concepts have led to the development and evolution of many web-based communities and hosted services, including weblogs (blogs), wikis, podcasts, RSS, and social networking sites. Barlow (2008) points out that Web 2.0 tools provide a huge and untapped resource for educators and thus offer an exciting opportunity to create a classroom without walls. McLoughlin and Lee (2007) argue that users of Web 2.0 not only create and own data, but also mix, amend, and recombine content. Furthermore, Boyd (2007) claims that the social aspects of Web 2.0 tools have great potential for enhancing education, while Klamma et al. (2007) suggest that Web 2.0 concepts and technologies could support lifelong learning communities.

Among popular Web 2.0 tools, wikis facilitate the publishing of users' products on the internet (Heafner & Friedman, 2008). Wikis' editing and history features are particularly helpful for tracing the content and timing of revisions. A number of studies have confirmed that wikis can foster collaborative learning, particularly in the area of primary- to university-level written English (Wang, 2010). Wikis are also useful for fostering a deep understanding of social studies (Heafner & Friedman, 2008) and helping pre-service teachers to produce high-quality science materials (Nicholas & Ng, 2009). Lai and Ng (2011) argue that wiki-based activities are effective in developing student teachers' abilities. The results of their empirical study on the applications of Web 2.0 in teacher education show the potential of using wikis to develop student teachers' knowledge and skills in several areas: IT, organization, collaboration, knowledge of subject content, knowledge of pedagogy, and assessment skills. They also point out that the effectiveness of learning and teaching is greatly influenced by a Web 2.0 environment and active participation.

In contrast, Wheeler, Yeomans, and Wheeler (2008) report that students are frustrated by the complex structure of wikis and apprehensive about their openness and the high level of participation required. This shows us that there are drawbacks to using Web 2.0 tools in education. Nevertheless, the visibility and user friendliness of wikis can foster student-centered learning and self- and peer assessment in the class (Ng & Lai, 2012). In addition, Macdonald, Weller, and Mason (2002) suggest that "[n]etworking opens up possibilities for enhancing formative feedback to students through peer review, when scripts are posted electronically for comment and review" (p. 10). Indeed, the effectiveness of conducting peer assessments online has been examined in detail and subsequently analyzed and confirmed by various studies (Buchanan, 2000; Kwok & Ma, 1999). Ansarimoghaddam et al. (2012) point out that wikis are increasingly gaining popularity in language learning. They reviewed the findings of empirical research studies conducted on the application of wikis in collaborative writing between 2005 and 2011 and concluded that wikis provide an interesting collaborative writing platform for the online community and are a useful and effective tool for the improvement of students' writing skills. They also reported that the usefulness of wikis for peer collaboration and peer assessment were realized in the reviewed studies, and that a high percentage of students perceived the use of a wiki-based collaborative writing environment positively.

Learning and assessment have traditionally been treated as two separate issues, the latter conducted after the former to evaluate what learners have absorbed and thus enable

instructors to accurately rank their ability. However, recent studies have shown that assessment should be designed to support learning rather than to select learners, and be embedded in the learning process with formative feedback (Biggs, 1996; Black et al., 2003, 2004; Morris, 1995). Berry (2008) suggests that assessment should be used to promote, induce, and reinforce learning. Peer assessment is recognized as a meaningful process for fostering learning effectiveness and developing learners' sense of ownership (Orsmond et al., 2000). Furthermore, well-constructed self-assessment and peer assessment exercises have the potential to provide valuable learning experiences and encourage lifelong learning (Berry, 2008).

Methodology

The present study was conducted in a Hong Kong secondary school. The teacher used Google Sites to develop a course wiki to supplement traditional classroom teaching. Thomas (2011) writes that this free wiki service allowed him to quickly build a collaborative classroom website which could be used by both students and teachers to communicate freely and instantaneously. Oakley (2012) suggests that this service is also one of the seven best services for business collaboration and teams, and that Google's website builder allows people without any knowledge of HTML or web design to create relatively simple sites quickly and easily. He also mentions that many users can view, or collaborate to edit, the content a Google site. Access to a site can be restricted to small or large groups, which is very helpful if you are working on a project either internally or involving external people. Furthermore, other Google services – such as Google Groups, Google Calendar, and Google docs – can easily be added to the site.

The present study adopted an action research approach consisting of three research cycles. Action research has frequently been advocated as a means of engendering reflective practice and promoting educational change. It also represents inquiry that is systematic, intentional, collaborative, and democratic in intent and process (Price, 2001). Action research affirms the professionalism of teaching by giving teachers a real voice in their own professional development. Mertler (2012) suggests that the basic principles of action research can be applied in four essential ways: the identification of educational problems, the development and testing of possible solutions, pre-service teacher education, and in-service teacher professional growth. Action research can be integrated with teaching and learning to enhance instruction in the K-12 classroom (Stringer et al., 2010).

Capobianco and Lehman (2006) viewed action research as a process that could result in the improvement of their own attempts at integrating technology to foster inquiry in an elementary science methods course. Thus, in each cycle of our study, the teacher, as a researcher, designed, implemented, and evaluated the instructional design supported by Web 2.0 technology. The study aimed to explore how wikis, one of the most popular Web 2.0 services, can be used to support the teaching and learning of Home Economics in secondary schools. It also aimed to find online learning activities that were suitable for teaching Home Economics topics. McPherson and Nunes (2002) propose that action research is highly appropriate for the development of eLearning. Capobianco and Lehman (2006) further point out that action research could increase our understanding of the ways in which students engage with technology. It also helps us generate new knowledge that could be shared with other teacher educators and researchers. The teacher researcher therefore expected our findings to serve as a reference for other teachers in the same subject area.

The participants

The students

The study was carried out in the teacher researcher's school, a subsidized secondary grammar school in Hong Kong located in an ordinary residential area. The school mainly receives students of lower academic achievement. In Hong Kong, all primary six students are ranked and categorized into three equal bands, 1 to 3. Most of this school's students came from the third band. Their interest in academic subjects is relatively low and they need more motivation. A class of 32 secondary one students aged twelve or thirteen, taught by the teacher researcher, participated in the study. The class was split into two smaller groups when doing practical work in the school kitchen. In each practical session, the students worked in groups and each group consisted of four members. The students had been taught the basics of making western desserts and pastries.

The teacher

The teacher, as a researcher, is the head of Home Economics in his secondary school. He possesses relevant qualifications and training in making western desserts and pastries. He also holds a bachelor degree in IT and has received formal professional training in teaching secondary IT subjects.

Based on the objectives of the study and the current situation, the teacher aimed to answer the following research questions:

1. What kind of wiki-based learning activities can be used to facilitate the teaching and learning of Home Economics?
2. Can wikis enhance both peer and student-teacher interactions?
3. Can wikis provide a collaborative platform for teaching Home Economics in secondary school?

Action research cycles

The present study is an action research study based on Deakin's action research model (Kemmis & McTaggart, 1988) and three research cycles were conducted, each one including four stages: plan, action, observation, and reflection. As "food preparation and cooking techniques" is the major teaching area in the junior secondary Home Economics curriculum (Education Department, 1994), students learn how to cook different kinds of food every year from secondary 1 to 3. The teacher researcher thought that it would be meaningful and important to explore new teaching strategies to improve teaching and learning of this topic. The lesson design aimed to explore how western desserts and pastries can be taught effectively in secondary schools by using wikis as a learning platform.

Initially, an exploratory stance was adopted whereby an understanding of our problem was developed, then the plan consisting of some form of interventionary strategy. The introduction of the wiki learning site is the major intervention in the first action cycle, the 'action' stage. Pertinent observations were collected in various forms as the wiki was being used as a learning platform (the intervention). The purpose of each stage in each action research cycle is shown in Table 1. The practical sessions were conducted as usual in the school kitchen Home Economics room.

In each subsequent action research cycle, the plan is revised according to the findings of the previous cycle and this "replan" stage serves the same purposes as the "plan" stage in the first cycle. Following the first cycle, the new interventionary strategies were then carried out

in the second cycle and the cyclic process repeated. Deakin's model, whose action research protocol was adapted for the present study, is depicted below in Figure 1.

Discussions of the interventionary strategies

This section offer a detailed description of the interventionary strategies for each of the research cycles, starting with the first (see Table 2).

Table 1. The four stages of an action research cycle

Stage	Purposes
Plan	• To explore different approaches in teaching Home Economics in secondary schools. • To investigate how Web 2.0 technology can be used to enhance teaching effectiveness.
Action	• To implement the planned lesson design supported by a course wiki that was developed by using free wiki services (Google Sites).
Observation	• To observe whether the interactions between teachers and students can be enhanced and the learning outcomes can be achieved with the current design. • To observe any problems and difficulties when applying new teaching strategies.
Reflection	• To evaluate the problems with the current design and practice. • To investigate how to improve the lesson design.

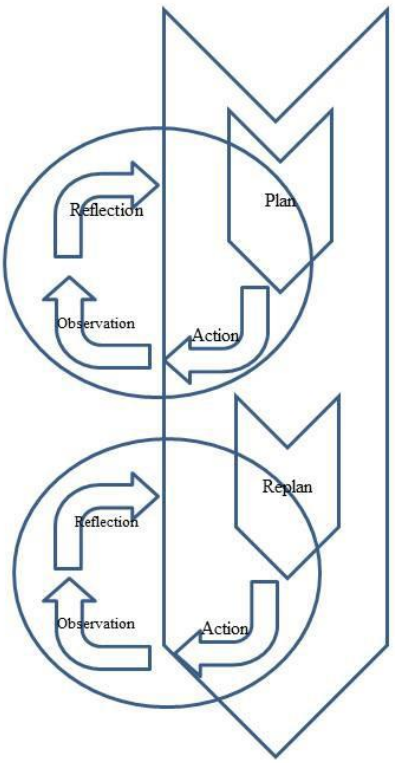

Figure 1. The adapted action research protocol

The "plan" stage for the first research cycle

Learning content: Hot Cake

Interventions:

- A course wiki was developed using Google Sites which enabled the participants to browse and download relevant learning resources and provided them with a convenient platform to share their learning outcomes.
- Face-to-face classroom teaching was the major teaching approach.
- The whole process was teacher-centered and guided by the teacher.

Table 2. Major tasks in the first research cycle

No.	Major Task	Participants	Activities	Observations
1	Creating the course wiki	The teacher	Using Google Sites to create a course wiki to teach Home Economics.	The teacher spent several hours creating and building the course wiki with the learning contents for the topic "western desserts and pastries". Link to the course wiki: https://sites.google.com/site/cake201112/ (see Figure 2)
2	Student training	The teacher and his students	Briefing the students on how to use the course wiki.	• The teacher arranged a pre-lesson workshop for the students to demonstrate how to use the course wiki. The workshop lasted about 70 minutes. • An email address was needed to log in to the course wiki as it was built using Google Sites. However, only half of the class had a personal email account. As a result, the teacher needed to show students how to create a Gmail account. • After logging in to the course wiki, the students had no difficulties in browsing and downloading the learning resources, e.g., the hot cake recipe.
3	Implementing classroom teaching	The teacher and his students	• The teacher explained and demonstrated the procedure for making hot cakes. • The students practiced making hot cakes. • The teacher took photos during the practical session, and also gave marks and comments for each group.	• Eleven students reported that they had read the hot cake recipe on the course wiki. However, only two had downloaded and printed the recipe and brought it to class. • When the teacher explained and demonstrated the procedure for making hot cakes, it was observed that only a few students were jotting down notes. • Some students were able to ask meaningful questions relevant to the teaching content.

Table 2. Continued

No.	Major Task	Participants	Activities	Observations
4	Sharing learning outcomes and giving feedback	The teacher and his students	• The teacher uploaded the photos taken in the practical session to the course wiki (see Figure 3). • He gave marks and comments to the students on the course wiki.	• The teacher spent about an hour selecting photos taken in the practical session. However, he needed to reduce their size before uploading to the course wiki. • The course wiki enabled students to share photos of their hot cakes, marks, and comments, so they had a clear picture of their own learning progress. • Some students were enthusiastic about sharing their experiences of, and difficulties with, making hot cakes. • Students and teacher were able to use the course wiki as an effective platform for sharing and exchanging their cooking experiences.

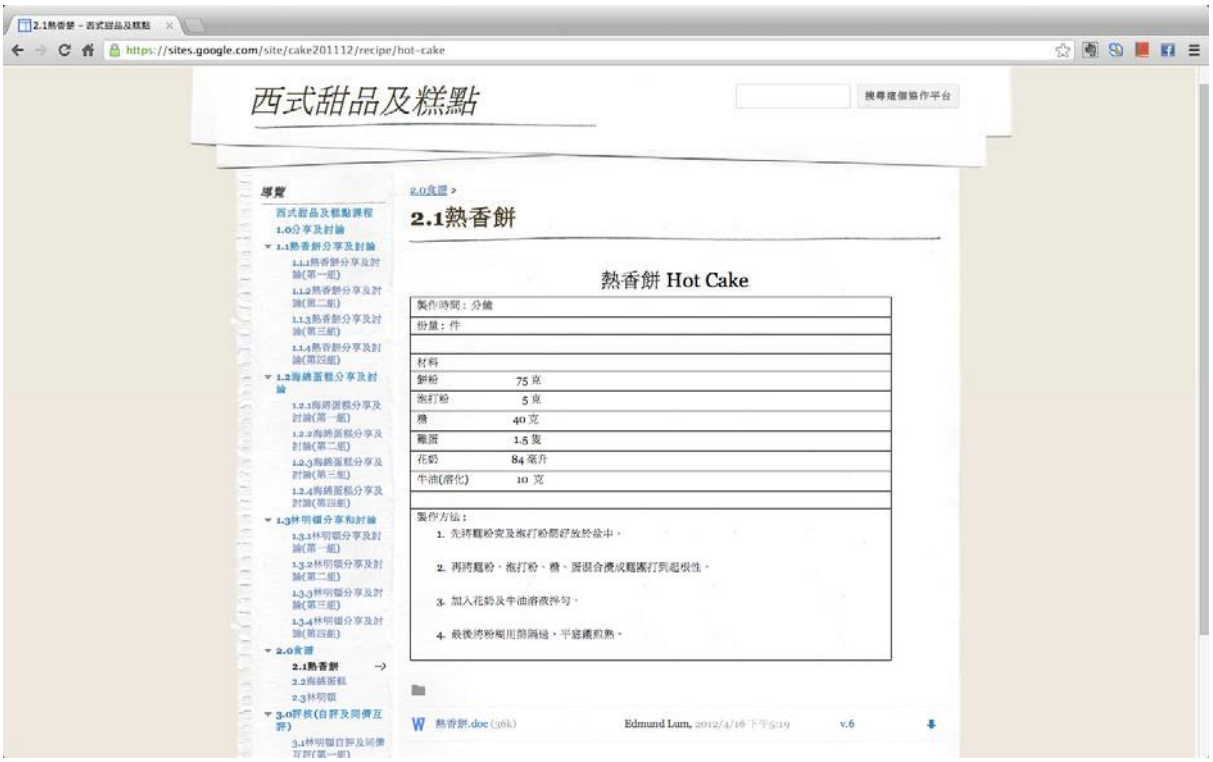

Figure 2. The course wiki developed by the teacher using Google Sites

Figure 3. Photos taken in the practical session shown on the course wiki

Reflections on the first research cycle

After completing the first action research cycle, the following points were observed:

1. The teacher was able to create and manage a course wiki with Google Sites. The course wiki served as a collaborative learning platform for students. However, the preparation work was time consuming and the learning resources had to be converted to a suitable electronic format before uploading to the course wiki. As a result, the teacher's workload was increased.
2. Not all participants possessed the necessary IT skills, so the teacher inevitably had to adopt different teaching strategies to cater to their individual needs. For example, some IT literate students were asked to help others create Google accounts so that they could access the course wiki.
3. The learning outcomes were also determined by the amount of time students spent using computer equipment at home. Some parents do not allow their young children to use computers, so these students could not access the site at home. If a participant was able to read the resources from the course wiki before the lesson, he/she would perform better in the class and could ask more meaningful questions.
4. Google Sites only allows one person to edit a given page at a time. If one student was editing a page, a second user would be blocked from modifying that page. This security measure was inconvenient when a number of students were asked to work on their group pages in class. In order to solve this problem, the teacher asked the students to just append comments to a page and not modify the page directly.
5. The participants were willing to let teachers record their cooking process. They felt happy to share the photos with others such as the school principal, their parents, and other students.
6. Some students were eager to ask questions and share their feelings about the

learning activities on the site. The teacher was able to give appropriate and timely feedback too, so the course wiki definitely enhanced interactions between peers and the teacher before and after lessons.

These findings gave the teacher new directions for refining the teaching strategies for the second research cycle. The interventionary strategies of the subsequent cycles will be summarized in next section.

Changes in interventionary strategies in the research cycles

Based on the findings from the previous action research cycle, the teacher researcher refined the interventionary strategies as follows:
Refined interventionary strategies in the second cycle:

- To encourage greater participation, some post-lesson questions would be posted on the course wiki for discussion. This also aimed to consolidate what the students had learnt in the class.
- To encourage self-learning, the teacher also required the students to work in groups to search for a sponge cake recipe on the internet. They were also encouraged to share their findings on the course wiki.

Refined interventionary strategies in the third cycle:

- In the first and second research cycles, the teacher assessed students' performance. In the third research cycle, self- and peer assessment strategies were introduced.
- Students would be required to give comments on their own performance and also on that of their peers.
- The teacher would film his students working through the cooking process and share the videos online. Students could review the video clips so as to have a clear understanding of their learning progress.

A summary can be found in Table 3.

Rethinking the lesson designs in the three research cycles

As the subsequent cycles repeated similar procedures, we will skip this information and just table the major features. To find better strategies for teaching cooking techniques, the analysis focuses on two important aspects: the teacher's reflections and the students' responses.

Teacher's reflections on the process

The teacher researcher reflected in depth on the following aspects:

- Teacher's preparation
- Students' technology competency
- Assessment strategies
- Classroom teaching and practical session
- Students' participation in wiki-based learning activities
- Technical concern
- Internet access after school, and
- Support from parents

Table 4 shows a concise summary of the teacher's reflections on the above aspects.

Table 3. The interventionary strategies used in the three action research cycles

Research Cycle	1	2	3
Learning content	**Hot cake**	**Sponge cake**	**Lamington cake**
Technology enhanced teaching strategies	• Face-to-face classroom teaching was the major teaching approach. • The whole process was guided and monitored by the teacher. • A course wiki was built by using Google Sites. • The participants could browse and download learning resources from the course wiki. • The course wiki was used as a convenient platform for sharing students' learning outcomes.	• Face-to-face classroom teaching and post-lesson online discussion were the major teaching approaches. • The course wiki was still used in the second cycle. • The course wiki was used as a convenient platform for sharing learning resources and students' learning outcomes. • More activities for promoting sharing and discussion were conducted in this cycle.	• Major teaching strategies adopted included: face-to-face classroom teaching, constructive feedback for students' assignments, and peer assessment activities. • The course wiki was still used as a convenient platform for sharing learning resources and students' learning outcomes. • Video clips of the students' learning processes were uploaded to the course wiki. This allowed the students to review their performance anytime and anywhere.

Table 4. Teacher's reflections on the process

Research Cycle	1	2	3
Learning content	**Hot cake**	**Sponge cake**	**Lamington cake**
Teacher's preparation	• The teacher was able to create and manage a course wiki with Google Sites. • However, the learning resources had to be digitized before uploading to the course wiki. • The preparation work was time consuming.	• The teacher continued to enrich the contents of the course website by including materials from reference books and other internet resources. • The teacher also attempted to post questions for online discussion. • The teacher's workload was unavoidably increased.	• The teacher continued to enrich the contents of the course website. • The teacher still spent a lot of time on preparing teaching materials in electronic form. • The peer assessment form and guideline were uploaded to the course website.
Students' technology competency	• Not all participants possessed the necessary IT skills, so the teacher needed to adopt different teaching strategies to cater to their individual needs.	• Students were asked to search for related recipes on the internet and also required to upload an example to the course wiki.	• Students took part in self- and peer assessment activities. They were required to fill in online assessment forms.

Table 4. Continued

Research Cycle	1	2	3
Learning content	**Hot cake**	**Sponge cake**	**Lamington cake**
	• Some IT literate students were asked to help others create Google accounts to access the course wiki.	• Students should be able to read the teacher's comments and answer post-lesson questions online.	• Students were encouraged to review videos of their cooking progress.
Assessment strategies	• Only the teacher gave marks and comments for the students' products. • Students can read each other's marks and comments on the course wiki.	• Post-lesson questions were posted for discussion. This enabled the teacher to better understand the students' learning process. • Students had more opportunities to share their cooking experiences with others online	• Students took part in self- and peer assessment activities. They had opportunities to taste the desserts prepared by other groups. They were also encouraged to exchange ideas during the class or on the course wiki after school. • Students could see each other's products, cooking procedure (videos), and final scores on the course wiki. This helped them understand the assessment criteria as well as how to cook (see Figure 4).
Classroom teaching and practical session	• Students attempted to make hot cakes. • Students were willing to let their teacher take photos of their cooking process and also their final products so that they could be shared with others.	• Students were able to make sponge cakes in the practical session. • Some students were interested in modifying the recipe, such as using different cake flavors and fillings. • The teacher took photos of the sponge cakes made by the students.	• Students were able to make Lamington cakes referring to the teacher's recipe and resources downloaded from the Internet. • Students took part in a peer assessment activity. They needed to taste the Lamington cakes made by other groups and could exchange cooking ideas during the class. • The teacher took photos and videos of the whole cooking process.
Students' participation in wiki-based learning activities	• Some students were able to read the teacher's recipe online. • They felt happy to share the photos taken in the class on the course wiki.	• More students had read the teacher's recipe online before the lesson. • All groups were able to search for related recipes on the internet.	• Students had read the teacher's recipe online before the lesson. • The students were able to download the forms for self- and peer assessment activities from the course wiki.

Table 4. Continued

Research Cycle	1	2	3
Learning content	**Hot cake**	**Sponge cake**	**Lamington cake**
	• Some students were eager to ask questions and share feelings about learning activities.	• Some students were able to upload a sample recipe to the course wiki for sharing. • Some students failed to answer the questions posted by their teacher.	• The students were able to complete the assessment forms online.
Technical concern	• Google Sites allows only one person to edit a page at a time. If one student is editing a page, a second user will be blocked from modifying it. • It is inconvenient when a number of students are asked to work on their group pages in the class. In order to record the learning process, the teacher asked the students to append comments to a page for discussing the changes and not to change a page directly.	• The teacher could use his own tablet (e.g., iPad), smartphone, or any internet access device to examine and review students' learning progress via the course wiki at anytime, anywhere. • Some students did not have printers at home. They were encouraged to read the materials online. This would help reduce paper consumption.	• Video clips were used to record the cooking process in this cycle. It was nice to find that the online videos ran smoothly.
Internet access after school	• The learning outcomes were affected by the amount of time spent online by the students at home. • If a participant could read the resources from the course wiki before the lesson, he/she would perform better in the class and could ask more meaningful questions.	• Some of the students could not complete their assignments on time. The teacher allowed the students to complete the online tasks in the school computer lab. • Some students attempted to share their practices in making western desserts at home.	• Some students were eager to share their experiences with others. They were quite active in the online activities, even after school.
Support from parents	• Some parents do not allow their children to use a computer, so they could not access the site at home.	• Some students failed to complete the online discussion part of the course as their parents do not allow them to use a computer at home. • The teacher let his students complete their work in the school computer lab.	• The teacher allowed students who could not work online at home to complete their work in the school computer lab.

Figure 4. Video clips of the cooking process on the course wiki

Focus group interview: students' responses to the learning process

The findings from the three research cycles show that a course wiki can enhance students' learning in Home Economics. A focus group for students was arranged to examine their views on the new instructional design. Table 5 shows a summary of the findings of the focus group interview.

Table 5. Students' responses in the focus group interview

Interview Questions	Student responses
1. Do you think that the wiki-based learning activities are time consuming?	Most of the students reflected that they had not spent too much time on reading learning materials online and completing the online activities. However, one student claimed that it was a waste of time, saying "*I hate typing.*"
2. Can the online learning platform help increase your interest in this subject?	All students agreed that the course wiki (a Google site) made them more interested in studying. They were eager to take part in the online learning activities.
3. Any further comments about the online learning platform?	Some positive comments from the students: *"I feel good about it. It is a new way of learning and I can interact with my teacher whenever I want."* *"It's fine with me. I don't have to ask questions in front of my teachers and classmates. I can ask them through the platform."* *"We can ask questions and view the course materials whenever we want. It is really convenient."* *"I can read all the recipes on the platform. I do not worry about losing my study notes now."*
4. In addition to the current content, what other materials should can be available on the learning platform?	*"I think it would be better to enrich the teaching notes with pictures."* *"I enjoy watching the video clips of making desserts and pastries online as we can review our learning process. Watching videos is more interesting than just reading text and looking at pictures."* *"I can also use my smartphone to finish my assignment online and answer teachers' questions."*

Conclusions and directions for future research

This article has discussed an action research on using a wiki as a course platform for teaching and learning Home Economics in a secondary school. The learning contents were related to making western desserts and pastries. The findings led to the following answers to the study's three main research questions.

Research Question 1: What kind of wiki-based learning activities can be used to facilitate the teaching and learning of Home Economics?

Lai and Ng (2011) point out that it is not only possible to integrate self-assessment and peer assessment in wiki-based activities, but also that the assessment helps students better understand what goes into well-designed wiki sites. It was observed that the participants of the study were eager to share their knowledge and experience through different kinds of self- and peer assessment activities. The findings (see Table 3) indicate that the students' performance was solely assessed by the teacher in the first and second cycles. However, in the third research cycle, self-and peer assessment strategies were introduced. Meanwhile, video clips of students' learning processes were unloaded to the course wiki. This allowed the students to review their performance anytime and anywhere and thus facilitated the integration of self- and peer assessment strategies with wiki-based learning activities. Also from the students' responses in the focus group interview (see Table 5), they felt good about the wiki-based learning activities as they can interact with the teacher whenever they want. One of the students advocated wiki-based activity as he/she didn't have to ask questions in front of his/her teachers and classmates. The wiki platform provided another means of communication for them. The research findings actually show that wiki-based learning activities should be incorporated with appropriate self- and peer assessment activities. The teacher is also required to give timely feedback to the participants and let them know the success criteria of the learning tasks. However, Ng and Lai (2012) also suggest that a training session could be introduced to instruct participants in how to perform an assessment prior to the actual assessment.

Research Question 2: Can wikis enhance both peer and student-teacher interactions?

The wiki platform was easy to use and only a little basic IT training was required. The findings confirmed that the course wiki provided a convenient and effective communication channel for the teacher and his students. The wiki-based activities also enhanced interactions between peers and their teacher. Learning was not confined to a small classroom or a kitchen; it could take place at any time and elsewhere. When students were practicing cooking at home, they could still find support from their peers or teacher without too much difficulty. In fact, the students and their teacher could access the learning materials and share their experiences whenever they had an internet access device to hand. However, we should note that the interactions could only be enhanced when appropriate teaching strategies were adopted. In the third cycle, peer assessment activity was introduced. This encouraged more online interactions as they were required to review other's products, cooking procedure (videos), and final scores on the course wiki (see Table 4). Furthermore, it also enhanced classroom interactions as they had opportunities to taste the desserts prepared by other groups.

Research Question 3: Can wikis provide a collaborative platform for teaching Home Economics in secondary school?

By using the right technologies, dessert and pastry recipes can be presented in various formats. The whole cooking process can be recorded in videos that are attractive and informative, which can also help arouse the students' interest in cooking. The course wiki also allowed students to share photos and videos taken by the teacher, which gave the participants a better understanding of the students' learning progress and their achievements. The findings of the study confirmed the usefulness of a wiki for teaching and learning Home Economics in secondary schools:

- It provides a convenient platform for the delivery of learning resources such as recipes, photos, and videos.
- It can arouse students' interest in the subject.
- It allows students to conduct learning activities online, including peer assessment activities.
- It provides a communication platform that enhances peer interactions and student-teacher interactions.

This supports the idea that wikis can provide a convenient platform for teaching Home Economics in secondary school. This type of platform provides a good means to facilitate sharing of resources, communication and collaboration. However, due to the constraints of time and students' experience, the interventionary strategies used in three design cycles may not be able to show the power of wikis in collaborative authoring. The researchers hope to explore more collaboration work that would be useful for learning Home Economics in secondary school. Nevertheless, this study also indicates that the teacher should possess some basic IT skills if a wiki is to be used as a learning platform, and that the teacher's workload is increased. The findings (see Table 4) also suggest that a basic level of technological competency and adequate support from parents are also crucial factors for students' success.

However, it is inadvisable to generalize the findings from a single case study. The authors hope that more studies can be done in different schools and also in different countries. Furthermore, this study was relatively short-term. If the course wiki could be used for the whole year, the findings would be more reliable.

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To cite this article: Lai, Y.C., & Lum, E.K.L. (2012). Enhancing teaching and learning of Home Economics in secondary schools with wikis: An action research study. *Themes in Science and Technology Education*, 5(1/2), 45-60.

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