An eLearning platform for distanced collaborative programming

Team Member: Chow Tsz Wun, Low Hau Sum, Mok Ka Hei
Supervisor: Dr Chui C K
FYP14006
CONTENT

Introduction
Objective
Project Flow
Project Setting
Technical Difficulties
Schedule
INTRODUCTION

The Missing Pieces of Learning Programming, collaboration

Education is old, so does the way we learning programming. Traditionally, we learn programming though teachers’ notes and guidelines, supplemented with tutorials, individual assignments and labs. This traditional way of learning programming is fine, designed to teach students the fundamental concert of programming and logic. However, when it comes to real world programming practice, something is missing.

Living in a cyber society connected with internet, we work productively by collaborating with each other. In order to learn and gain more experience on collaborative programming, a new form of programming education is needed. We seek cues from Facebook and Codecademy, learning how they developed a successful modal. Now we introduce our platform for online collaborative programming learning to disrupt traditional programming education.

Our Learning platform for collaborative programming values “collaboration” the most. We introduced numerous core features like collaborative drawing board, team matching system, voice and message chat, peer comment and concurrent document editing.
Past Case Studies

Codecademy is by now the most similar product in the market. It is an online learning platform for programming where students can login and learn programming with step by step guide. Our Learning platform however, focus on enhancing student’s collaboration skills on programming, rather than each student finish their programming assignment on their own like Codecademy.

Beside, our platform is especially designed for university and secondary school, where students should challenge themselves to finish the collaborative assignment that posted by their teachers.
OBJECTIVE

i. Provide an online platform for distance collaborative programming
ii. Enhance students’ collaboration skills and promote positive peer interaction via platform
iii. Facilitate teachers to evaluate students’ progress

The ultimate goal of the project is to provide an interactive and user-friendly eLearning platform with multifarious resources for distanced collaborative programming. With the help of the platform, collaboration and communication among students are promoted through the sharing of knowledge and experience. Meanwhile, teacher can easily assess students’ performance using the platform. It is hoped that the platform can help students to learning collaborative programming effectively.
PROJECT FLOW

Basically there will be four main phases when using this platform.

DESIGNING ASSIGNMENT
Before students can make use of this platform, teacher has to design the assignment first by giving description of the task, requirement, specification and size of team. Also, teacher needs to submit a sample code and test case. The platform will then execute the sample code to obtain the answers.

GROUP MATCHING
After the teacher has submitted the assignment, the computer will automatically match students who have taken the course. Each team may contain students from HKU, student from Macau or even student from university overseas.

When the team is formed, members will be notified by Email and moved on to next phase.

DISCUSSION PERIOD
First of all, students need to fill in their preferred time for discussion in 24 hours scope. The platform will try to suggest a suitable time for discussion for all teammates.

The platform will provide voice chat function for discussion. In case they cannot find a suitable time to meet, chat room function is also provided for leaving messages. We think that effective way of communication is the key to collaborate.

Students will stay in this phase unless all members in team agree to proceed, or the timer is exceeded. During this phase, students can only work on the collaboration board.
CODING
Students can start coding in this phase, supplemented with voice chat and text chat. They will be coding in a style like Google Docs on the platform simultaneously.

Their work in the collaboration board in previous phase will be passed into this phase. And they can keep making use of board and editing the contents.

Time based versioning control will be implemented for them to recover their work.

SUBMITTING TO GRADE
Each assignment has a deadline set by teacher. The system will grade students’ work by compiling their source code and comparing to the test cases after the deadline is passed. After the deadline, statistic of performance for each team will be visible to teacher.
PROJECTING SETTING

PROJECT DESCRIPTION
The eLearning platform is a combination of an online integrated development environment and cloud code editor. It allows users to work together on a single programming project at the same time. Also, users can compile source code and execute it online. To achieve the objective of being an online learning tool, several essential features are introduced.

REAL-TIME CODE EDITING
Concurrent code editing is the core function of the platform. Multiple users can edit the same code concurrently. Changes will be saved in the server and show the all users instantly.

The “last edited by” for each class will be displayed on the screen. And time-based versioning control will be implemented for them to recover their work.

COLLABORATION BOARD
Collaboration board is workplace for users to brainstorm ideas, shape the program and unify coding style. With the help of drawing tools, students can visualise their ideas by drawing flowcharts or diagrams on the real-time whiteboard. Besides, it facilitates students to manage the project by allowing them to discuss issues like program design and work division.
**AUDIO AND TEXT CHAT**
To enhance communication between users, the platform will support both audio and text chat. Users can chat with each other with familiar instant messaging or by starting an online group conversation.

**PEER COMMENT**
Students are encouraged to leave comments on other students' code and tag the comment. Providing peer feedback lets students develop monitoring mechanisms for their own learning activities.

**STATISTIC**
Some useful data will be collected, including the duration of voice chat, number of messages and types of comments, to see the degree of collaboration.
TECHNICAL DIFFICULTIES

To implement real time collaboration, some technical difficulties are expected to encounter, for example data concurrency issue to maintain a most updated version of the programming file to achieve real time coding.

Video and voice chat is also a problem. We have to think how to due with multiple data streaming and data handling.

For the collaboration board, we should first research on the best way to for students to interact. User experience is also one of the key area to be focused here. One possible solution is to reference more successful modal in the market.

SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 2014</td>
<td>Project Plan and Project Web Page</td>
</tr>
<tr>
<td>Oct 2014 - Jan 2015</td>
<td>Preliminary Implementation</td>
</tr>
<tr>
<td>Jan 2015</td>
<td>Interim Report Preparation</td>
</tr>
<tr>
<td>Feb 2015</td>
<td>First Presentation</td>
</tr>
<tr>
<td>Feb 2015 - Mar 2015</td>
<td>Finalized Implementation</td>
</tr>
<tr>
<td>Apr 2015</td>
<td>Final Report Preparation</td>
</tr>
<tr>
<td>Apr 2015 - May 2015</td>
<td>Project Exhibition Preparation</td>
</tr>
<tr>
<td>May 2015</td>
<td>Project Exhibition</td>
</tr>
</tbody>
</table>