

# **COMPSCI 345 / SOFTENG 350**

## **Human-Computer Interaction**

### **Assignment Two: Low-Fidelity Design**

**Worth 10% of your final grade**

**This assignment is due Friday 12 May 2017 at 4.00pm**

**This assignment must be done in groups of 4**

#### **Aims**

The aim of this project is to give you experience with the early stages of user interface design, and user interface design within a group environment.

#### **Background**

Delivering high-quality education is a vital goal for any society that wishes to remain competitive in the global economy. Computing offers many opportunities for enhancing the traditional learning experience. One way this can happen is through computer mediation of peer group interaction and feedback in problem-based learning.

Your group has been assigned to design a problem-based learning environment that supports peer group interaction. The system will be aimed at intermediate and secondary school students (ages 11-18). English language markets will be targeted in the first instance, including public and private school systems of various countries (i.e. don't limit your thinking to the NZ domestic market or NCEA standards). Incidentally, your employer is affiliated with a large academic publisher that has a vast array of existing learning materials and capacity to source further material as needed. As such the challenge is not to produce content per se, but to design the environment that presents the student with specific problems and provides an interface for them to formulate a solution and to receive and offer peer feedback.

Assume that the system is designed to help students work fairly challenging problems for their age (i.e. to take learning further than typical currently at NZ intermediate school level, more like higher NCEA or starter University levels).

#### **The application**

Students will be assigned to peer groups (typically of sizes 3 to 5) and given assignments to complete online with your system.

Students will be expected to complete the assignments using a combination of in-school and after-school time. You expect that they will be working in school computer labs (or in a 'bring your own device' setting) and with their own hardware and Internet connection (or using school labs after class hours, e.g. for students who don't have the hardware/connectivity at home or are awaiting pick-up from their parent/guardian). At any rate, you will assume they have good connectivity (e.g. would allow video streaming) both to your system's server and to the external Internet. The student and their peer group members will sometimes, but not always, be working on the assignment – or at least logged into the system – concurrently (i.e. live chat will sometimes be an option).

Assume a minimum screen size of a Microsoft Surface (effective size 23.5cm x 13cm). For purposes of paper prototyping, you can design to (the somewhat larger) A4.

Choose **one** of the 3 following domains as the topic for your system:

- Art history
- Drama
- Physical education (the 'knowledge' aspects – you're not physically training the user with the system)

Your design should work for a wide range of materials in this topic. However, just to be concrete in your scenarios and in any specific data that your design may show, pick **one** sub-topic within your domain. For example:

- For art history: baroque architecture, or harmony in Western music;
- For drama: a specific Shakespearean tragedy, or soliloquies in Shakespeare
- For physical education: strength training for contact sports, or the role of lactic acid in exercise

The choice is yours.

Further, your design should support some version of **two** of the following types of problem-based learning assignments:

- Case with structured questions. The student reviews a case and provides brief responses to a set of questions. Members of the peer group provide feedback on the student's answers, and the student provides feedback on the answers given by the members of their peer group. *Variant:* Peer discussion of the case and responses is done prior to formulating individual answers (instead of, or addition to, peer feedback on the individual answers).
- 'Solution' to a problem. A problem with a context is outlined for the student. The student then constructs a solution to the problem and an explanation/justification of their solution. Example: a student may be asked to design (and justify) a training schedule for a specific sports team with particular requirements. Peer feedback is provided on solutions and justifications. *A neat variant:* The 'solution' is to produce a work in a prescribed style. For instance, a student may be asked to construct a 'missing' soliloquy for a character in a Shakespearean play; or easier, to suggest a subject and key characteristics of such a soliloquy (after all, "Create a portrait in the style of Rembrandt" is a tough assignment, and is more about Painting than Art History!).
- Online portfolio. The student produces a portfolio of related works under a problem statement (for instance maybe they were asked to discuss each of three paintings illustrating different phases in the career of a famous artist, placing each in the context of the artist's personal situation and major artistic movements of the time). Peer group members then give feedback to each other on the whole portfolio.
- 'Conference on X', or 'Channel X'. The whole peer group works together to produce a series of related works (a bit like the portfolio, maybe each student compiles a brief biography of a French Impressionist painter). Peer discussion begins with coordinating scope and work allocation and continues with peer feedback as each student does their part. The final result is a group presentation of some form (essays, visuals for an in-class presentation, or a set of videos – one by each student).

The students may be accessing the external Internet, and very likely are also learning from lecture and in-class discussion (as well as perhaps an 'old-fashioned' textbook!). However, your system should be designed to present essential key materials and allow 'working' of the problem without navigating out of the system or using other applications, including:

- The full problem and associated assignment 'statements' (what the student is expected to do)
- The features to do the assignment (e.g. a way to compose a response to a question, and to provide peer feedback to another member of the student's peer group).

- Key materials sufficient for providing a solution to the problem (text, embedded videos – custom-developed or re-used with permission and source citation)

While at this stage we're not doing electronic prototyping and should avoid pinning ourselves down to implementation-specific details, it's reasonable to assume the system is accessed through a Web browser (just to have an idea of what kinds of interaction will seem 'conventional' in the context of use).

## Scope of Assignment

Your group must produce the following deliverables:

1. Design document, including:
  - a. Introduction – Clearly indicate the domain, the sub-domain and the two types of problem-based learning assignments selected for your prototype. Provide any explanation you believe is useful for how you interpreted each problem-based learning assignment type for your sub-domain. If you feel it appropriate, cite any specific sources (outside of slides and readings for this course) that were instrumental in your thinking about the design, particularly any website that your design may resemble closely in specific ways. This section is not marked per se – your purpose is just to orient the marker and satisfying academic integrity for acknowledgment of sources.
  - b. Personas – **two** personas (two students representative of your expected users). Preface the personas by a brief (100-200 word) rationale for your choice of personas.
  - c. Scenarios – **four** scenarios (two for each of your personas, and two for each type of problem-based learning your design supports). Each will represent one occasion (one sitting) of use of the system by the persona; some may be individually brief. This probably won't cover every possible feature of the system, but should be selected to illustrate the most interesting features. Aim for an average word length of 150-250 words per scenario, including any headers such as goal statement or those related to PACT analysis.
  - d. Requirements – A description (hierarchical and mostly dot points) of what the system can do from the user perspective. Your key objective here is for the marker to understand what to look for in terms of the scope and functionality of your prototype.
  - e. Conceptual Design – Provide a brief (50-100 word) description of your process and key findings, including who participated (two or more members of the group) and providing a supporting photo (e.g. of your post-its, whiteboard, cards or the like). Then provide a 'neat' (i.e. tidy, electronic rather than handwritten) illustration of your conceptual design, including at least one diagram – e.g. a hierarchy or network – and as much or little accompanying text as you feel appropriate (suggestion: about 100 words).
  - f. Visual and Interaction Design – provide a rationale (50-150 words each) for **three** design elements of your paper prototype. In the rationale for each element, provide explanation of how theory of visual design (e.g. aesthetic and Gestalt principles) and/or theory of interaction design influenced your design decisions. You are free to interpret 'elements' broadly, but most likely in each instance an element will be either the visual appearance (especially layout and grouping) of a screen or part of a screen or a way of interacting (e.g. a drag-and-drop interface).
2. Low-Fidelity Prototype. A hand-drawn (pen and/or pencil, not coloured in) physical paper prototype that supports your scenarios.
3. Video. Not more than 3 minutes duration showing the prototype being 'used' (Wizard of Oz style) for your four scenarios; one member of your team operating the prototype and one member playing the role of user (unfortunately, none of your team members is an intermediate school student – but we'll make due in this case).

The prototype itself (and sometimes the user's hands, but not the user's face) should be visible throughout the video, preferably with sufficient clarity that the text can be read, or at least such that the marker can easily identify which parts of the physical paper prototype are being shown. The video must include an audio description of what is happening – for instance as voiceover commentary or think-aloud by the user.

In all cases omit authentication (login) from your screen designs – this might vary from installation to installation, and could well be integrated with a more global login to the school network or such. In the scenario write-up, this step can be expressed with a statement like “Mary sits down and logs into the system.” Similarly, don't include a logout button (or any account or system settings). For the scenario write-up, if appropriate (such as for a scenario in a shared lab) you can add something like “Mary logs out of the system.”

In Assignment Three you will be individually implementing an HTML prototype for the system. Note that you will be allowed to follow the low fidelity design your group develops for the present assignment *but you will not be obliged to do so* (i.e. you will not be marked on how closely your working prototype corresponds to your low-fidelity design).

### Group Formation

A good group will have members with a range of skills, look for diversity rather than your friends. Groups will be registered in Canvas. Please DO NOT randomly start a new group – form your group and then register it. If you do not sign yourself up to a group the tutors will assign you to a group. Likewise, if you form a group of 3 expect to have another person assigned by the tutor. There will be no groups of 2, 3, 5, etc. – do not ask (of course we may end up with one odd group but this will probably be people who have dropped out ☺ )

### Group Marking

Each member of the group will submit a confidential allocation of percentage of work done by all group members. This will be submitted through a Google doc form, link to be published later. Your mark for this assignment will consist of the marker's grade modified by the average group specification of your contribution.

### Deliverable Materials

You should provide the following deliverables for this assignment:

		Submission
1	A single PDF document which contains <ul style="list-style-type: none"><li>- The cover page, including link to YouTube video (use template file)</li><li>- Introduction, Personas, Scenarios, Requirements, Conceptual Design and Visual &amp; Interaction Design documentation</li></ul>	To Canvas (1 per group). Name file to indicate your group number (e.g. G12.pdf)
2	A set of hand-drawn illustrations of the interface (the 'paper prototype') with printout of cover page at front of transparent folder	To physical dropbox in Student Resource Centre – make sure cover page is visible
3	Video of the paper prototype being used	Upload to YouTube and include its link in cover page of 1 (do not revise after the submission deadline)

**You should plan to spend no more than 15 hours each on this assignment.**

**Questions** Direct questions about this assignment to Ziwei ([zliu674@aucklanduni.ac.nz](mailto:zliu674@aucklanduni.ac.nz))

Markers will assess your deliverables as follows:

<i>Deliverable</i>	<i>Features</i>	<i>Marks</i>
Personas	Good rationale. Each is complete, believable and memorable.	10
Scenarios	Collectively cover key tasks. Goals, contexts and activities of personas are clear.	10
Requirements	Makes scope and functionality clear.	5
Conceptual Design	Clear with adequate detail.	10
Visual and Interaction Design	Good rationales. Understandable and attractive when viewed on prototype. Effective and efficient for scenarios.	20
Design Document Presentation	Overall document reads well, is easy to understand. This includes using correct grammar and spelling.	5
Low-Fidelity Prototype <i>per se</i>	Complete for scenarios, well-constructed, well-drawn (by hand, but clear)	10
Video <i>per se</i>	Makes good use of time (not rushed, doesn't drag). Clear and easy to follow. Illustrates key aspects.	10
<b>Total</b>		<b>80</b>