

# Design Process and Rationale

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## Overview

Excel Warm-up is a small-scale self-directed WBT (asynchronous) to teach 1st year MBA student at Stanford Graduate School of Business how to use and apply 3 specific advanced skills of Microsoft Excel: “Data Table”, “Goal Seek”, and “Audit” functions. Our design and development of the content and instructional methods of the Excel Warm-up and the selection of media elements and technologies are situated in appropriate learning theories and guided by appropriate teaching and learning design principles. Other considerations also includes time and cost of the development and existing technologies. The details of design process and rationale are presented below.

## Readiness for E-Learning

We first investigated whether our organization was ready for e-learning. Our investigation results show that we do not need to take any step to make us ready for e-learning because everything is there.

### Is our organization ready for e-learning?

#	Question About Our Organization	Yes	No
1	Do learners have access to computers capable of displaying e-learning materials?	•	
2	Does the organization have network and Internet connections fast enough to support e-learning?	•	
3	Is technical support available to help e-learners over hurdles?	•	
4	Do potential e-learners possess the necessary computer skills?	•	
5	Are instructors and instructional designers knowledgeable about e-learning?	•	
6	Does top management support e-learning?	•	
7	Do the management teams for training, information technology, and HR understand and support e-learning?	•	

## Labor Distribution

We then split labor among our group members. Jasper was primarily involved in providing content and writing course plan. Wuping contributed to designing web and selecting appropriate instructional methods and also took the role of project management. The reason why we did so is that Jasper has expertise in using Excel in a business environment and Wuping is experienced in web design and pedagogy with some experience in e-learning project management. Content is crucial for a WBT course, while

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delivering medium and project management are equally important. Therefore, we believe we equally distributed the labor between us. The specific labor distribution is listed below.

### Responsibility Distribution among the Development and Implementation Team

<b>Managing the Project</b>		
Responsibility	Required for the Project?	Person for the Job
Business Management	No	
Project Management	Yes	Wuping Lu
<b>Designing the Course</b>		
Responsibility	Required for the Project?	Person for the Job
Overall Design Integration	Yes	Wuping Lu & Jasper Pan
Instructional Design	Yes	Wuping Lu
Software Architecture	No	
User-Interface Design	Yes	Wuping Lu
Subject Matter Expertise	Yes	Jasper Pan
Knowledge of Buyers of Training	No	
Knowledge of Learners	Yes	Jasper Pan
<b>Building Content</b>		
Responsibility	Required for the Project?	Person for the Job
Course Integration	Yes	Wuping Lu
Writing	Yes	Jasper Pan
Graphics	Yes	Jasper Pan
Multimedia Development	Yes	Jasper Pan
HTML Coding	Yes	Wuping Lu
Browser Scripting	No	
Server Scripting	No	
Content Scripting	No	
<b>Providing the Technical Infrastructure</b>		
Responsibility	Required for the Project?	Person for the Job
Network Engineering and Administration	Yes (Existing)	SUSE
Server Administration	Yes (Existing)	SUSE and Wuping Lu
Database Connectivity	No	
Technical Support	Yes (Existing)	SUSE
<b>Conducting E-Learning</b>		
Responsibility	Required for the Project?	Person for the Job
Curriculum Administration	Yes	Jasper Pan & Wuping Lu
Facilitation	No	
Live Instruction	No	

### ADDIE Model

We followed a generic and simplified instructional systems design (ISD) model – ADDIE to design our project. ADDIE is short for Analyze, Design, Develop, Implement, and Evaluate.

#### Analyze

In the analyze phase, we clarified the instructional problem, established the goals and objectives, and identified the learning environment and learner characteristics. Based on the information we found, we came out the ABCD Appraisal Checklist.

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## ABCD Appraisal Checklist

### Audience

The audience of “Excel Warm-up” is 1<sup>st</sup> year MBA student in Stanford Graduate School of Business

- Most student among 25-30
- Average working experience 3-5 years
- Previous experience mostly in business, but diverse in terms of function (marketing, business development, operation, R&D, entrepreneur etc.)

They are 1<sup>st</sup> year students not yet start regular courses in business school

- 1 month before the school starts
- They know that when course starts, they will have to use Excel as a basic tool to handle many courses like Finance, Data Analysis etc.

The audience mostly has previous experience with Excel but without deep experience or expertise

- Students who previously worked in Consulting, I-banking or any other occupation which requires significant amount of Excel skill will NOT attend this course
- Prerequisite: Students who have NO Excel experience must took other “Excel Basics” in order to took this course

### Behavior

The audience is expected to learn 3 specific advanced skills of using Excel. Upon completion, the learners will be able to

- Use “Data Table” function to analyze mid-size amount of data
- Use “Goal Seek” function to solve single input model
- Use “Audit” function to trace and modify equations

### Conditions

The student will perform the Excel skill in public or private PC computer

- Most student use lap-top, have to design without very complex mouse utilization
- Student use PC/windows platform
- The software required will be Microsoft Excel 2000 or above version

The student will learn Excel skill in home or school computer lab via web based learning media

- In school the bandwidth is 10Mbps
- At home, most students use Yahoo! DSL or Comcast Broadband (256Kbps – 1.5 Mbps)
- Student use PC/windows platform and use IE as internet browser
- The software required will be Microsoft Excel 2000 or above version

### Degree

For the 3 applications introduced in this course, the students should be able to perform these analysis in the below condition

- Each analysis should be done within 5 minutes
- Given the time limit, student should be able to solve the problem 100% correctly
- The quality of analysis should be decided by comparing the standard answer of the exercise and the analysis result performed by students

Based on the ABCD Appraisal Checklist, we re-worded the **learning objectives** as follows:

Upon completion, you will be able to

- Apply “Data Table” function to analyze mid-size amount of data
- Apply “Goal Seek” function to solve single input model
- Apply “Audit” function to trace and modify equations

We believe these objectives are measurable and achievable.

The wording of objectives was guided by Bloom’s Revised Taxonomy and the following rules

- Translating teaching objectives to learning objectives and using words that reflect what learners want to do, not what we want to do.
- Stressing application of training and clearly communicating how learners will apply the knowledge and skills they gain in training

In our ABCD appraisal checklist we used “Upon completion, the learners will be able to”, while in our web-based training course, we changed in into “Upon completion, you will be able to.” The change was justified, because, in the first case, the audience was ourselves and/or stakeholders; while in the second case, the audience was learners and therefore using “you” instead of “the learners” justified by “Personalization Principle.”

## **Design**

### *Content*

Our targeted audience is first year MBA students at Stanford. Based on our learner study and task analysis (needs analysis, summarized in ABCD Appraisal Checklist), the audience mostly has previous experience with Excel but without deep experience or expertise. Advanced use of Excel such as Data Table, Goal Seek, and Audit function will be needed in their MBA study, but the program will not provide any training in using Excel. Preparing them to be able to apply advanced Excel will fill their skill gap and facilitate their MBA study. The online course will include three modules: Using “Data Table” Function, Using “Goal Seek” function, and Using Audit” function. We believe the content is appropriate because these skills will be frequently used in their coming MBA study.

### *Instructional Methods and Selection of Media Elements*

Excel Warm-up is a Self-Directed WBT. Web-based training is an effective way to teach and learn soft skills. The learning is self-paced and asynchronous. The reason why we decided to do so is

- The learning task is to learn procedural steps. Although synchronous activities may help, there is no-significant-difference effect between asynchronous and synchronous
- Learners have unpredictable schedules.
- Using synchronous add more cost and require more advance technology

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The training course includes three modules, each addressing a different function. They don't need to be learned in a certain sequence and can be learned independently. This organization gives more control to learners. Learners can choose what they want to learn and in any sequence. If they know some of the topics, they can miss them and just learn the topics they do not know.

Content will be organized from simple to complex, practice will be interspersed throughout the lesson. According to practice principle and behaviorist approach, both practices and the way in which they are distributed contribute to better learning.

All practice exercises will mirror the real world problems. Practice exercises will require learners to process information in a job-realistic context. Questions that ask the learner to merely recognize or recall information previously provided in the training will not promote learning that transfers to the job.

We will offer two ways to deliver the instruction: a. screenshot and text; b. streaming video lecture. Both ways can improve learning and are justified by multimedia principle. The rationale behind offering two delivery ways can be justified by our learner study. Some students prefer visual learning, others prefer auditory learning. We offer both, so each of them can learn in their preferred learning style.

Students may frequently ask the same questions regarding how to use and apply these advanced Excel functions. We will group these questions and answers and add a FAQs section to the online course. FAQs will work as a learning agent to help students learn. Due to cost, time, and technical limits, we think this is the most economical way to promote learning.

There is also a tutorial for each module and a tutorial combining all three modules on the course website so that students can print them and study any time and anywhere.

Tests will also mirror the real world problems so that we know if students can transfer what they have learned to job.

We originally wanted to incorporate a discussion board for students to post their questions and exchange ideas to create a collaborative learning environment. Later, we realized that it was unjustifiable for reasons as:

- It will incur more cost
- There is no-significant-difference-effect effect between using discussion board and not using discussion board
- The server hosting our online course does not support this feature

Due to these reasons, we abandoned our plan to incorporate a discussion board. Instead, we will use a mailing list for collaborative learning if needed.

### Miscellaneous

- We are going to use tables to align web elements so that it is easy to read.

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- There is also a sitemap for easy navigation
- A search button for learner to easy locate the information

Based on the instructional methods and the media elements we chose, we developed a technology shopping list which includes all the technology we are going to use to develop and implement our online training.

### **Technology Shopping List**

#### Technological infrastructure

The entire project will be a web-based program

Host server: LDT server in the School of Education

Client site platform:

- MBA lab in Graduate School of Business
- Internet connection is 10Mbps Ethernet
- Windows XP platform
- IE 6.0 and Microsoft Excel 2003 installed

#### Authoring tools

Website building:

- Microsoft FrontPage 2003 and Dreamweaver MX

Learning object building:

- SnagIt: screen shot capture
- Fireworks MX: Narration added and Graphics
- Camtasia: illustration recording
- Adobe Acrobat 5.0: PDF tutorials

### **Development**

Since our team has done solid work during the first two phases of the ADDIE methodology, the training development phase proceeded smoothly and quickly.

#### Prototype

Based on decisions made during the design phase, we created a training prototype – a tangible sample that everyone can see and discuss. It shows what the final course will look like when it is complete. Since it is simple online course, detailed step-by-step storyboards are not needed.

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Jasper pretended to be the client. We discussed the prototype to ensure the design meet our client's requirements and goals. Also, the prototype was posted on Blackboard for feedback.

### Course Materials

After the prototype was approved, we used various tools in our technology shopping list to create all the materials.

### Tabletop Review

After the course has been developed, we conducted a tabletop review. This time, Wuping pretended to be the client. We checked the content's accuracy and completeness. We walked through the course materials as experts looking for errors rather than as learners interacting with the course. The tabletop review serves as a quality assurance step. We check the course's content before any learners interact with the course. We found some typing errors and corrected them.

### Pilot Testing with Actual Learners

After the tabletop review, we conducted a pilot testing and put the course in front of the learners and measured how they interacted with the materials. This was the first time actual learners experienced the course. It provided us a final chance to review the course prior to its official launch. We found that the learners were confused about a few instructions. We changed the wording of the instructions and made them clearer.

### **Implementation**

After pilot testing and revision, we uploaded all course materials into ldt server. We then posted the link on Blackboard and notified learners about course.

### **Evaluation**

When a course launches, it's not the end of the process. The ADDIE evaluation phase provides a final review checkpoint for the project. During the evaluation phase, we measured how well the project achieved its goals. Again, Wuping pretended to be the learner. The evaluation findings listed below.

Do learners like the course?	Yes
Do learners achieve the learning objectives at the end of the course?	Yes
Do the learners change their behaviors in the workplace?	Yes

Since the evaluation results met our goals, we do not need to make any revision to the online course. It is well-done

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