
New York University

Class # 11
Spring 2005

Design Evaluation

Overview

• Introduction
• Model for Interface Design Evaluation
• Types of Evaluation
  – Conceptual Design
  – Usability
  – Learning Outcome

Design Evaluation

Introduction

Definition of Evaluation
Evaluate: to assess or appraise.
Evaluation: process of examining instructional materials and rating it based on its value and effectiveness.

Method
Uses assessment and validation tools to provide data for the evaluation. Assessment: measurement of the practical results of the instruction; Validation: determines if the objectives of the instructional goal were met.
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Evaluation Plan

Evaluation Cycle

1. Complete Checklist of Issues
2. Identify Purpose and Key Questions
3. Develop Data Collection Tools
4. Collect Data
5. Analyze and Interpret Data
6. Ensure Use through Collaboration and Feedback
7. Report Evaluation Results

Design Evaluation

Model for Design Evaluation

• Evaluate Conceptual Design
  – Steps in Design
  – Theoretical Foundation
  – Conceptual Design of Instruct. Strategies
• Usability
  – Ease of Use, Ease of Learning
  – User Acceptance
• Learning Outcome
  – Effectiveness

Interface Design Approach

Definition Human-Computer Interface

• Interface design is the process of selecting interface elements and features based on their ability to deliver support for the cognitive processes involved in the instructional activities facilitated by the application. (Plass, 1998, p. 39).
Design Evaluation

Interface Design Model

Definition Human-Computer Interface

- Interface not merely in charge of communication with the user, but is an
- Expression of the **deliberate decisions** by the instructional designer to include **features** in the conceptual model of the application that support different cognitive processes of learning

Design Evaluation

Design Evaluation

Design Model

Implement System Design

Develop Instructional Interaction Design

Develop Instructional Information Architecture

Design Instructional Information Architecture

Analyze End-User Requirements

- Problem Identification
- Identify Target Audience
- Needs Assessment
- Determine Learner Characteristics
- Define Goals
- Define Objectives

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Information Architecture

Definition
- Defines the content and features to fulfill objectives of a web site and how they are structured

Purpose
- Conceptual Design of Web Site for Programmers to implement: Flow chart

Components
- Conceptual Design: Features
- Content: Organization of Information
- Navigation/Orientation Systems

Design Process for Information Architecture
- Map Objectives -> Features
- Map Features -> Content
- Structure Features
- Organize Content
- Design Navigational System based on Structure
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Interaction Design

**Definition**
- Specifies the interactions between users and each feature of the application, including
  - Type and format of input
  - Logic of processing
  - Type and format of output

**Purpose**
- Specify the detailed functioning of each feature of the system

Information Design

**Definition**
- Specifies the appearance of the interface and the information contained in the system, such as
  - Presentation mode of information
  - Color Scheme for interface
  - Type faces and their forms (attributes)

**Purpose**
- Specify the appearance of each feature of the system

Implement System

**Implement Prototype**
- Programming (Coding)
- Produce media elements (graphics, video, etc.)
- Design and develop data base back end (tables)
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Developmental Evaluation

Evaluate

• Each phase of the design process
• Usability of the system
• Learning outcome
• Using living system capabilities

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Interface Design Evaluation Approach

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Analysis

Evaluation

• Expert review of the goals, objectives and target audience specifications
• Review user logs
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Information Architecture

Evaluation
• Verify that instructional theories/frameworks and epistemological/philosophical beliefs used for the design of the features are appropriate for learners and content
• Verify that features sufficiently support the intended type of learning
• Review of the mapping process of features onto objectives and content onto features
• Review appropriateness of navigation

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Interaction Design

Evaluation
• Review design of instructional strategies and how they support learner’s cognitive processes
• Review if the required conditions for the application of a particular design principle were met and if this design principle or theory was applied in an appropriately way
• Review if instructional strategies support the chosen learning theory/approach

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Instructional Strategies

Presentation Modes of Information

• Taxonomy

Social Setting

Learning Mode
Design Evaluation

Information Design

Evaluation
- Review design of instructional strategies and how they support learner’s cognitive processes (function of multimedia elements)
- Review if the required conditions for the application of a particular design principle were met and if this design principle or theory was applied in an appropriate way (Dual Coding Theory, Cognitive Load Theory, Generative Theory of Multimedia Learning)

Interaction Design Evaluation

Application of Pattern Language
- Articulates and communicates the design of the entire system in a coherent, formal way (Alexander, Ishikawa & Silverstein, 1977; Tidwell, 1999)
- Units of language: design rules, or patterns, that capture the solutions to specific issues or problems in the design process in a particular context, and are therefore neither too abstract nor too specific

Implement System

Evaluation
- Evaluate Prototype
- Usability
- User Acceptance
- Effectiveness
Interface Design Evaluation Approach

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Usability Testing

Purpose
- Assess the ease of use and ease of learning in the system as well as subjective acceptance by users

Criteria
- Content Quality, Clarity & Accuracy
- Ease of use
- Emotional Response
- Medium-Specific/Appropriate content
- Navigation

Methods
- Surveys
- Interviews
- Think-aloud protocols
- Walkthrough techniques
- Videotaping
- Recording log files of user actions
- Heuristic Evaluation/Expert Evaluation
- Experimental/Quasi-Experimental Designs
Design Evaluation

Ease-of-Use/Learning

Criteria
- Time needed to learn specific system functions
- User retention of commands over time
- Speed of task performance
- Number of clicks/steps for task performance
- Error rate in task performance
- Ease of Navigation
- Usefulness of Features (actual)

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Ease-of-Use/Learning

Inspection
- Cognitive Walkthroughs
- Heuristic Evaluation/Expert Evaluation
- Feature Inspection
- Perspective-based inspection

Inquiry
- Field Observation
- Focus Groups
- Recording log files of user actions
- Proactive Field Study
- Surveys

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User Acceptance

Definition
- Subjective Usefulness of System Features

Criteria
- Navigation
- Screen design and layout
- Terminology
- Consistency and match with the user's tasks
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User Acceptance

Methods
- Surveys
- Interviews
- Focus Groups

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Interface Design Evaluation Approach

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Design Evaluation

Learning Outcome

Purpose
- Determine effectiveness for learning

Criteria
- Recognition
- Production
- Recall
- Transfer
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Learning Outcome

Methods
- Multiple choice tests
- Matching tests
- Concept Mapping techniques
- Transfer tests

Cognitive Science

Group Activity (groups of 4)

Evaluate an Instructional Web Site:
- Specify an objective for the Evaluation
- Select a Method for the Evaluation
- Decide on Evaluation Criteria
- Prepare Evaluation Plan
- Report the results of your evaluation in the discussion section in Blackboard under the software’s name.