Cover Page for Paper Presented at ICTE 2000 Conference in Potchefstroom, South Africa, April 16-19, 2000

Paper ID 129: Learning System Design Considerations in Creating a Web-mediated Learning and Performance Environment: A Case Study

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LEARNING SYSTEM DESIGN CONSIDERATIONS IN CREATING A WEB-MEDIATED LEARNING AND PERFORMANCE ENVIRONMENT: A CASE STUDY

Scott P. Schaffer

INTRODUCTION

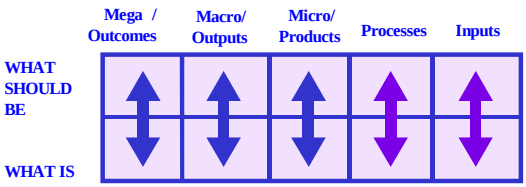
This case study provides an overview of a project with the U.S. Navy. The purpose of the project was to create a learning and performance environment designed to increase the readiness of leadership training facilitators and, by association, sailor on-the-job performance and naval readiness.

The major learning objectives of the environment were to: 1) Increase facilitator access to and collaboration with peers, sailors, and outside experts; 2) Increase access to current leadership knowledge through ongoing development of a knowledge base; and 3) Increase facilitator problem solving and critical thinking skills through the use of case study and scenario assessment tools.

The intention of this paper is not to showcase technology. Rather, it is to discuss the design of environments for learning and performance. The focus is on the identification of key learning outcomes and work environment factors that match the requirements of the performers and the organization as they attempt to accomplish their objectives.

PERFORMANCE SYSTEM DESIGN

The design of a learning and performance system within the facilitator community began with an assessment of the environment and its subsystems. This assessment was centered around two frameworks of organizational performance: The Organizational Elements Model or OEM (Kaufman, 1998), and the Performance Pyramid (Wedman & Graham, 1998). The OEM identifies the levels of system results expected by an organization at three levels: Societal, Operational, and Job. The processes and inputs of an organization such as training, human and financial resources, and quality programs are identified and assessed relative to their linkage to the organizational results levels. The Performance Pyramid identifies several components of an organizational system that must be in place for optimal individual and organizational performance. These components include: Feedback and Expectations; Tools, Equipment and Information; Rewards and Incentives; Motivation and Self-concept; Capacity to Perform; and Skills and Knowledge. All of these components support performance and it is important to identify how these components will support or hinder any performance improvement process during the assessment process.



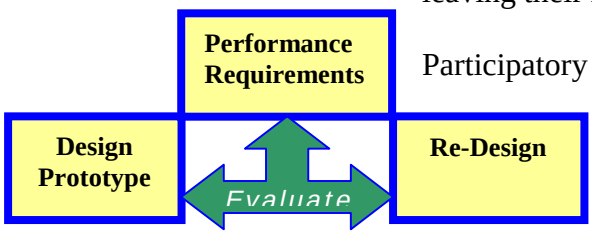
Assessment methods used to collect this performance system data included interviews with managers and top performers, questionnaires completed by current facilitators, and

focus groups with performers. The goal of this process was to identify the organizational vision, mission, goals, and performance factors that make up the leadership facilitator community. A profile of the best practices of this community and the areas requiring the performance support were identified with project stakeholders.

LEARNING ENVIRONMENT DESIGN

Prototype Design, Evaluation, and Re-Design:

A decision was made to create a web-based online learning environment since this delivery system supported many of the features desired by the leadership facilitator community, and allowed facilitators across the world an opportunity to interact without leaving their home base.



Participatory design processes using the basic process model shown here were used to build stakeholder and user commitment to the project through their active participation in the analysis of requirements and the specification of the system design. For this project, each design iteration and improvement was based on discussions with key stakeholders and potential users. Participants and designers collaborated to develop a valuable product, identify possible product improvements, and generally provide guidance in the ongoing design of the product. Design principles included: user-centeredness, iterative processes, as well as a focus on the learner: outcomes, motivation, feedback, interaction, and collaboration.

The website evaluation was conducted simultaneously throughout the design process. It began with assessing the aesthetic quality of the site, and following redesign, assessed the content, learning activities, and whether or not the site objectives have been achieved. The first level of evaluation was with facilitators at the NLTU in Norfolk, VA. Upon familiarizing the facilitators with the basic goals of the site, LSI provided them with the URL and received feedback regarding basic changes.

During this concurrent design and evaluation process, interviews and focus groups were conducted during which visual prototypes clarified concepts that were being discussed. Initial prototypes were PowerPoint slides, which were transformed into the actual web site using MS Front Page and other HTML editors. The target audience provided feedback regarding the site design and content. A “joint application design” meeting was held with Navy leadership representatives during which the site was reviewed live. The evaluation team asked structured interview questions during the live site review. The purpose of this meeting was to collect data to assist in design decision-making. This design iteration ensures that the organizational learning and performance objectives of the site will be addressed. Following this meeting, revisions were made accordingly in order to prepare the site for rollout and user evaluation.

EVALUATION AND CONTINUOUS IMPROVEMENT

Following site rollout, the following learner evaluation processes were conducted:

1. Learner/Performer Evaluation - A survey has been placed on the site to gather input from facilitators regarding their reactions to site content and learning activities, and suggestions for improvement. Users also have the opportunity to provide feedback on the site discussion board.
2. A site review was conducted with a novice user to observe a typical user interaction and resolve any barriers to navigation and learning. This process was similar to the participatory review by Navy leadership. The user went through each activity and made suggestions for the content and layout of the site.

Evaluation probes were developed in each of the categories below for the purpose of long term site evaluation. Communities were encouraged to enhance these probes as required.

Strategic Organizational Context

- Ely's *Eight conditions that facilitate technological innovations*
- Roger's Innovation-Decision process stages
- Kaufman's Organizational Elements Model

Organization-Work Center Context

- Gilbert's Behavioral Engineering Model
- Wedman and Graham's Performance Pyramid

Performer Context

- Gilbert's Behavioral Engineering Model
- Keller's ARCS motivation strategies
- Wedman and Graham's Performance Pyramid
- Dick and Carey's *Systematic Design of Instruction*
- Keller's ARCS motivation strategies

User- Computer Interface

- Nielsen's heuristics for human-computer interaction

REFERENCES

Dick, W. & Carey, L. (1996). *The Systematic Design of Instruction* (4th edition). Reading, MA: Addison-Wesley.

Ely, D. P. (1999). Conditions that Facilitate the Implementation of Educational Technology Innovations. *Educational Technology*, November – December, 23-27.

Gilbert, T. (1978). *Human Competence: Engineering Worthy Performance.* Amherst , MA: HRD Press, Inc.

Kaufman, R. (1998). *Strategic Planning Plus: An Organizational Guide* (Revised Ed.). Newbury Park, CA: Sage Publications.

Keller, J. (1987b). The Systematic Process of Motivational Design. *Performance & Instruction*, 26 (9), 1-8.

Nielsen, Jacob. How to Conduct a Heuristic Evaluation. [on-line]. Available: http://www.useit.com/papers/heuristic/heuristic_evaluation.html

Rogers, E.M. (1995). *Diffusion of innovations (4th ed.).* New York: Free Press.

Wedman, J. & Graham, S. (1998). The Performance Pyramid. *The Journal of Continuing Higher Education*, Fall, 46 (3), 8-20.

Wenger, E. (1998). Communities of Practice: Learning as a Social System. [on-line]. Available: http://www.co-i-l.com/coil/knowledge-garden/cop/lss.shtml