Supporting Clinical Information Seeking across Users with Diverse Educational Backgrounds

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ABSTRACT
Consumers with limited education often have difficulty using online health information resources. In this project, we describe the development and evaluation of a Web-based health information resource that supports consumers with diverse educational backgrounds by presenting all information within a single dynamic Web page with four levels of hierarchical organization. Evaluation by 31 diverse consumers revealed that the tool was highly usable and navigable regardless of the consumers’ educational levels.

INTRODUCTION
Online health information resources play a critical role in the medical decisions made by millions of lay consumers.1 However, navigating through dense online health information resources can be difficult, especially for individuals with limited cognitive skills.2 In particular, such individuals may have difficulty with online resources that require them to navigate through multiple screens and links to identify relevant information. In this project, we describe the design, implementation, and evaluation of a Web-based information resource that was developed to support consumers with limited cognitive capacity through the presentation of information within a single dynamic screen with multiple levels of hierarchical organization.

METHODS
Application Development
The educational Web site was developed using standard technologies, including Visual Studio 2005, VB.Net, ASP.NET for Web applications, and SQL Server 2000.

Design Objectives
- Organize complex information hierarchically to facilitate searching
- Maintain referential context
- Minimize scrolling
- Rigorously and selectively track all information accessed
- Use standard industry technologies
- Achieve high level of usability

Study Subjects
- Adults with age > 24 years
- Active smokers (lifetime use of >100 cigarettes)
- No previous participation in a Duke smoking study
- Volunteers recruited from the community

Usability Study
- Three open-ended questions
- Four validated usability questionnaires
- 51 questions using 5- or 9-point Likert scales
- 31 subjects completed all study instruments
- $40 compensation
- Approved by Duke University Medical Center IRB

RESULTS
Study Subject Demographics
- Mean Age = 44.6 ± 11.2
- 56% female
- 61% African Amer., 35% White, 3% mixed race
- 29% with High School education or less

Design Features (see Figure 1)
- Maintain primary screen throughout session
- Horizontal tabs (arrow 1)
- Unique color for each topic (arrow 2)
- Enlarge tab when selected (arrow 2)
- Vertical tabs (arrow 3)
- Color reflective of parent tab (arrow 3)
- Enlarge tab and lighten color when selected (arrow 4)
- Toggle arrows for additional information (arrow 5)
- Expose information when section selected (arrow 6)
- Trail to show what information has been viewed (7)

DISCUSSION
Regardless of educational level, consumers found it easy to find information, to know where they had been, and to get around on the Web site. Overall, consumers felt the resource was very user-friendly, and reported they would recommend the Web site to others and would come back themselves in the future.

The approach described in this study could be adopted by online health information resources to facilitate the effective retrieval of information by consumers of diverse educational backgrounds.