Team 2: Select Component Task Analysis

February 17, 2010

Sally Byrd
Susan Conrad
Ryan Curran

Table of Contents

Introduction

The George Mason University (GMU) Immersion team conducted a thorough performance analysis in the fall semester which included a Front End Analysis report, a Briefing Report, and a Needs Assessment report. Through this analysis which included a series of meetings and interviews with Defense Acquisition University (DAU) faculty and staff and a survey about DAU learning assets and course design and development processes, the GMU Immersion team proposed an online support tool solution to aid DAU in making decisions regarding technologies to integrate into their courses while providing research and tutorials on pedagogically sound use. An important part of this support tool is the Select component. The Select component was envisioned as a job aid that would walk users through a series of questions about learning objectives and specific DAU factors to create awareness around various uses of technology and help users select the most appropriate technology for their needs.

Taxonomy

To effectively meet learning objectives, instructional designers employ a focused learning-outcome taxonomy to identify and classify tasks into categories. These categories tie tasks to learning outcomes by distinguishing the appropriate instructional strategy for the learning objective. In reviewing an appropriate taxonomy for the Select tool, it was apparent that Gagne's, Bloom's and Merrill's taxonomy each provided a viable approach, however the Jonassen and Tessmer (1999) taxonomy yielded the greatest benefit for the Select tool task analysis. Jonassen and Tessmer concentrate on knowledge acquisition by incorporating cognitive, metacognitive and motivation learning outcomes into their model.

To select the appropriate taxonomy, the Select Team adhered to the procedures identified by Jonassen, Tessmer and Hannum (p.30).

1. Identify your purpose for classifying the tasks: The purpose is to identify the key features required for users to select technologies which will enhance learning outcomes for specific learning objectives.
2. Identify the taxonomic assumptions and purposes of the author: The Jonassen and Tessmer taxonomy was created to meet the learning outcomes of ill-defined projects which focus on knowledge acquisition and knowledge transformation. The Select component, by virtue of its DAU unique requirements and multi-dimensional factor relationships, make it an excellent example of a complex, ill-defined knowledge acquisition problem.
3. Test the taxonomy's usability: The Jonassen and Tessmer taxonomy focuses on knowledge acquisition and application that are key components of the select tool.

Executive control, ampliative skills, and self knowledge are inherent in the Select component making it usable for complex problem solving and decision making.

4. Test the taxonomy's comprehensiveness: Through use cases and brainstorming, the completeness of the tasks associated for the Select component were addressed. Although we have accounted for current requirements, we do realize that, as we proceed throughout the design process, other tasks may be revealed for inclusion.
5. Test the taxonomy's productivity: By reviewing use cases and creating flowcharts, we have tested the efficiencies and relevance of the Select component.

To further substantiate the validity of the Jonassen and Tessmer to the Select component, we have highlighted the functional requirements of the component in relationship to the key constructs of the Jonassen and Tessmer taxonomy:

- Motivation:
    - Developing a learning environment which will motivate the learner to use the component.
- Self Knowledge:
    - The Select component will address the learner's unique personal knowledge. This requires the component to be flexible to address learning needs from multiple points of view and user requirements.
- Ill Structured Problems:
    - The Select component will provide information to solve complex problems with multiple variables.
- Ampliative skills:
    - The Select component will assist the learner make choices realizing that the user will make inferences based upon other factors not included within the component.
- Executive Control Strategies:
    - The Select component will address the varied goals a user may have when utilizing the component. Some users may have a goal for a specific learning while others may want an overview of options for technology use.
- Structural Knowledge:
    - The Select component will incorporate data from numerous sources allowing the user to create information based upon semantic networks and personal experiences.
- Mental Models:
    - The Select component will assist the user to transfer knowledge across multiple situations for decision making.

While the taxonomy for task analysis for the Select component was addressed by the Jonassen and Tessmer model, it should be pointed out that Bloom's taxonomy also plays a key role in functionality of the Select component. Adhering to DAU's methodology, the Select component utilizes Blooms taxonomy to identify learning activities with course objectives. By integrating the Bloom's taxonomy into the Select component, we are best able to create a framework that will fit within the current DAU process.

Task Analysis Methodology

Task analysis provides a framework for describing the activities and the differing levels of knowledge that are required to perform a task. Task analysis evaluates the knowledge and sequencing required to execute the task. In evaluating task analysis methodologies, Team 2 selected the Rational task analysis which is a type of Information Processing Analysis (IPA) as outlined in Jonassen, Tessmer and Hannum (p. 88). In this method, the goal is to create an idealized model. The Select component integrates the key elements DAU uses to make decisions regarding learning asset creation. In this component, learning objectives and DAU factors are included in the decision making process. The IPA model analyzes how "competent" individuals may be in performing tasks and how they evaluate multiple factors to make decisions. The Select component models the idealized process and adheres to a process.

Team 2 followed the steps outlined in Jonassen, Tessmer and Hannum (p. 89) to conduct the IPA.

1. Determine if the task is amenable to IPA: In this step the Select component was conceptualized as a series of steps which the user follows to select technologies or learning strategies.
2. Write down the terminal objective of the task: In the Decision Widget of the Select component, the user identifies a goal of either technology or learning strategy.
3. Select Task Performers: Through our interviews and meetings, the GMU Immersion team interviewed DAU users with multiple levels of experience and decision making ability. This provided us with a rich understanding of the requirements from a variety of users.
4. Select a data gathering procedure: Data for the Select component came from interviews, meetings and a user survey. The survey provided the content for the Factors Matrix and the qualitative interviews provided data about the current learning asset development process.

5. Observe and outline the task performance: All information gathered through interviews, surveys, and meetings were documented and classified in the Needs Assessment. This information provided the data for the task analysis outline which became the backbone of the Select component.
6. Review and revise the outline: The Select team utilized use cases as a method to review the task outline for the Select component.
7. Sketch a flowchart: Based upon the use cases, which represented the task performance, flowcharts were developed.
8. Review the flowchart: Flowcharts were shared with peers to highlight errors and enhancements.
9. Field test the Flowchart: We performed a preliminary field test with our DAU coach, Rebecca Clark, and made modifications based upon her feedback.

Utilizing the IPA process, the terminal objective of the user's task in the Select component is to "make a decision" about what technology to use to fulfill their needs. The Select component will offer users three avenues to arrive at their decisions. We mentally walked through the performance of this task and outlined the task performance as a series of steps in our scenarios and use cases as outlined in Constantine and Lockwood (1999).

Use Cases and User Actions

To best understand how DAU would benefit from the Select component, team 2 performed a creative brainstorming session to identify potential applications for the Select component. After carefully classifying these applications utilizing the Jonassen and Tessmer taxonomy, we identified three use cases. Each use case consists of a scenario, user actions and system response table, and flowchart.

Scenario 1: Selecting a technology based upon a learning objective

Marsha Jones, an instructor at DAU, has heard that adding technology to a course will help students learn more effectively and improve her student evaluations. Marsha has selected one learning objective that she would like to fulfill with a technology tool. She has not selected a learning strategy for the objective and is looking for guidance in determining the learning strategy and technology. Marsha goes to the select component in the LATIST tool. Marsha selects the verb “analyze” for her learning objective. She is presented with a list of several learning strategies. Marsha selects "discussions". The system presents a list of all technologies appropriate for discussions. Marsha selects “blog” and thinks about how this information will help her colleague Joan. She emails the information presented by the Select tool on blogs to Joan.

selectingTechnology

User Action	**System Response**
chooses decision widget	
	Displays option for Learning Objective or Technology
selects Learning Objective	
	Decision Widget displays learning objectives
Selects learning objective- “Analyze”	
	Display learning strategies
Choose learning strategy “Discussion”	
	Display technologies
Select technology “Blog”	
	Display technology info on “Blog”
Share “blog” information	

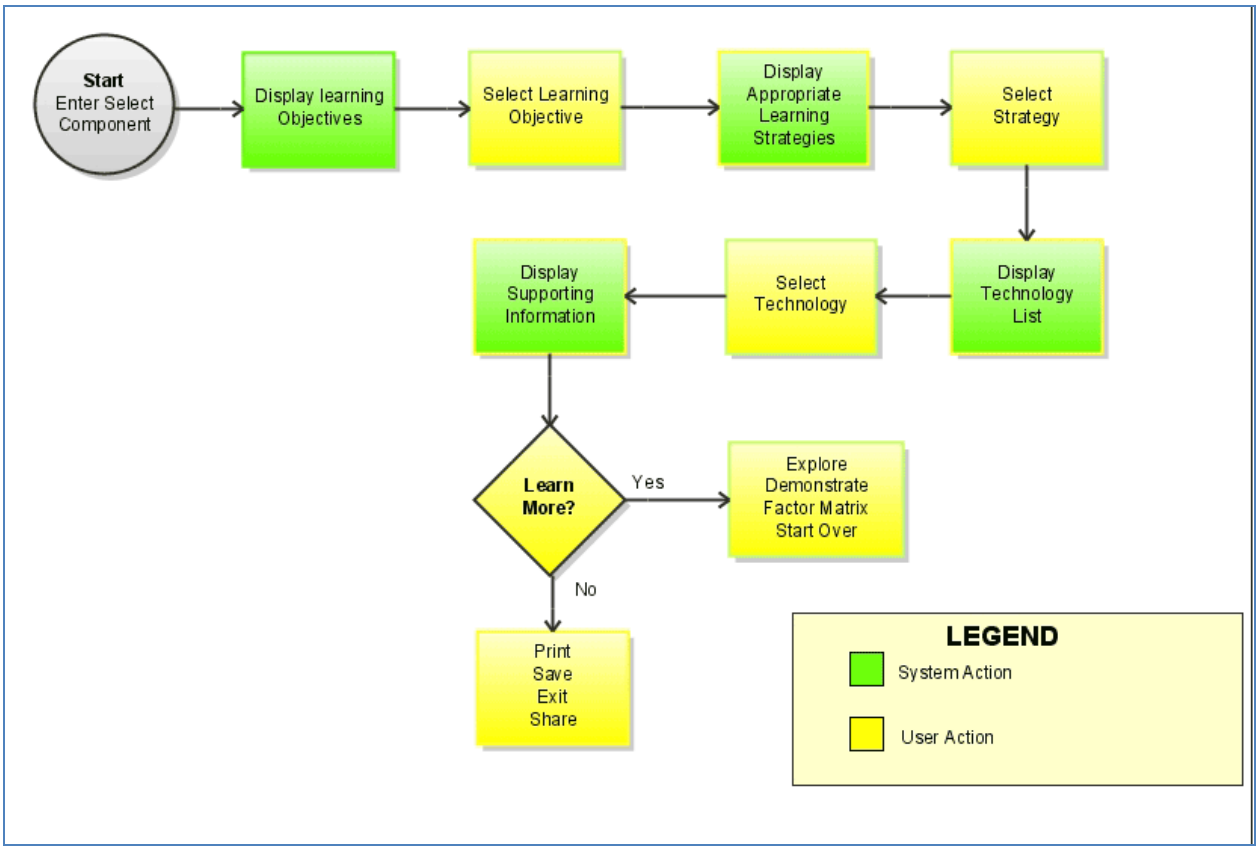

Figure 1.Selecting Technology Flowchart

Scenario 2: Implementing a particular technology in a learning asset

Cash is a course manager for the DAU and is charged with updating a continuous learning module (CLM) with a social network. His superior is requiring him to use a social network, so he has been given no latitude on which technology to use. It must be a social network. Cash is interested to know specifically what learning strategies are best supported by social networks. Cash heard of LATIST and has decided to give it a try. Cash enters LATIST and chooses the SELECT component where he is given two options: the Decision Widget or the Factors Matrix. After reading the concise description on the page, Cash knows to click on the decision widget. After selecting the widget he is offered two choices: Enter your learning objective or Select a technology. Cash chooses Select a technology and is given a list of technologies. Cash selects "Social Networks" and is then provided information as to what learning strategies are supported best with social networks. After reading about these learning strategies, Cash is curious to know about how other organizations are currently using social networks and selects "Explore". Cash is re-direct to another component of the LATIST system where current examples are listed. Cash is happy.

selectingStrategy

User Action	**System Response**
chooses decision widget	
	decision widget displays
chooses Select a technology	
	displays a list of technologies
chooses social networks	
	displays requested information and links to other components
chooses Explore link	

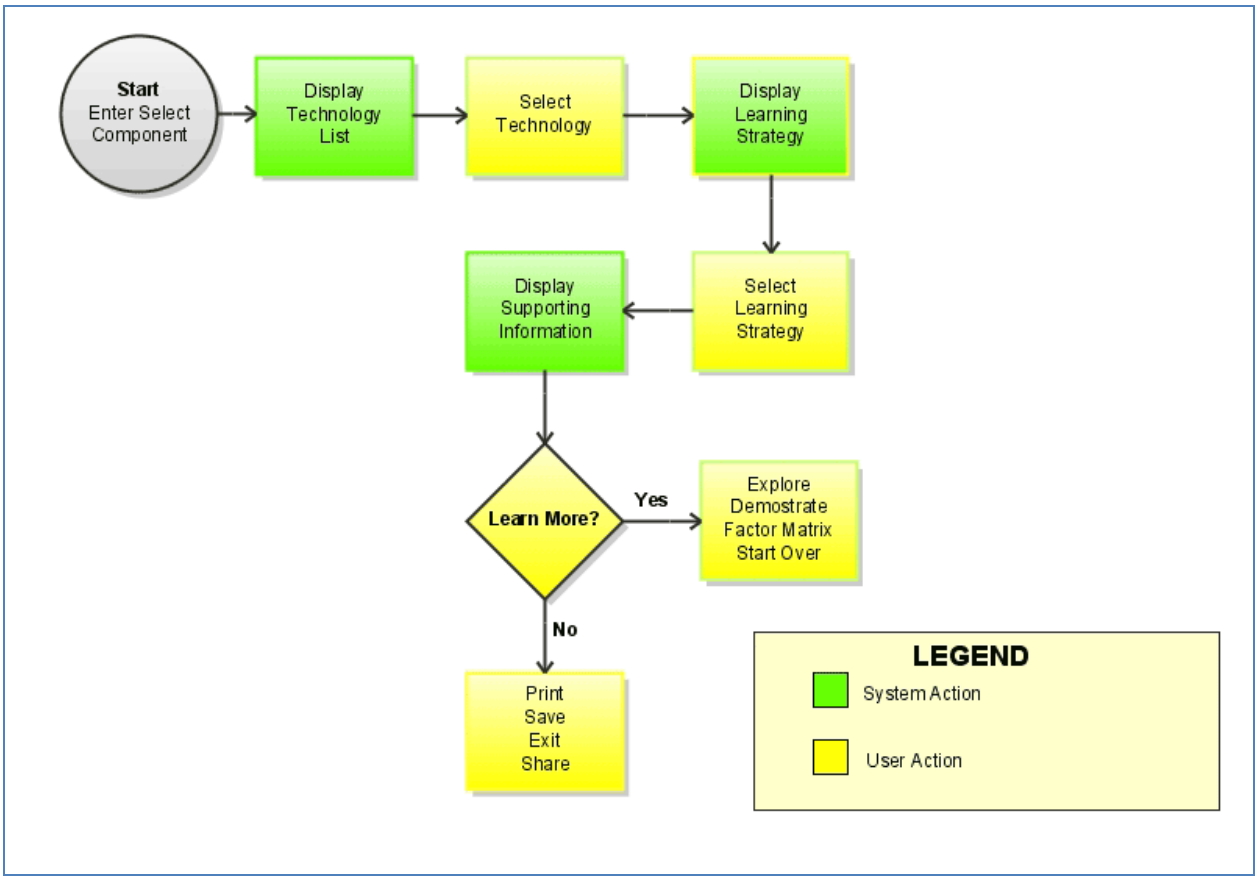

Figure 2: Selecting Technology Flowchart

Scenario 3: Updating a course and exploring options

Joe is an Instructional Designer for DAU. He is working on a team to update a course and has been tasked with finding appropriate Web 2.0 technologies that will suit specific learning objectives and strategies. He knows quite a bit about integrating technology into courses, however he's concerned with finding something that will work within the tight budget and time constraints of his project. He knows that he needs a technology that will support collaborative work and knows that blogs and wikis will work well for this. He goes to LATIST and chooses the Select component. He's offered two choices: Find a technology to suit your learning objective or See a matrix mapping DAU factors to technology. He chooses the Factors Matrix and clicks on the cost category. He sees that blogs, wikis, and social networks fall within his budget. He doesn't know much about social networks. He clicks on social networks and a full report of DAU factors and how they relate to social networks, including links to more information from the Explore section and links to a tutorial in the Demonstrate section displays. He clicks on the link to Demonstrate to see the tutorial.

exploringOptions

User Action	**System Response**
chooses Factors Matrix	
	Factors matrix displays
chooses cost category	
	displays technologies mapped to cost factors
chooses social networks	
	displays social network report of factors and links
chooses Demonstrate link	

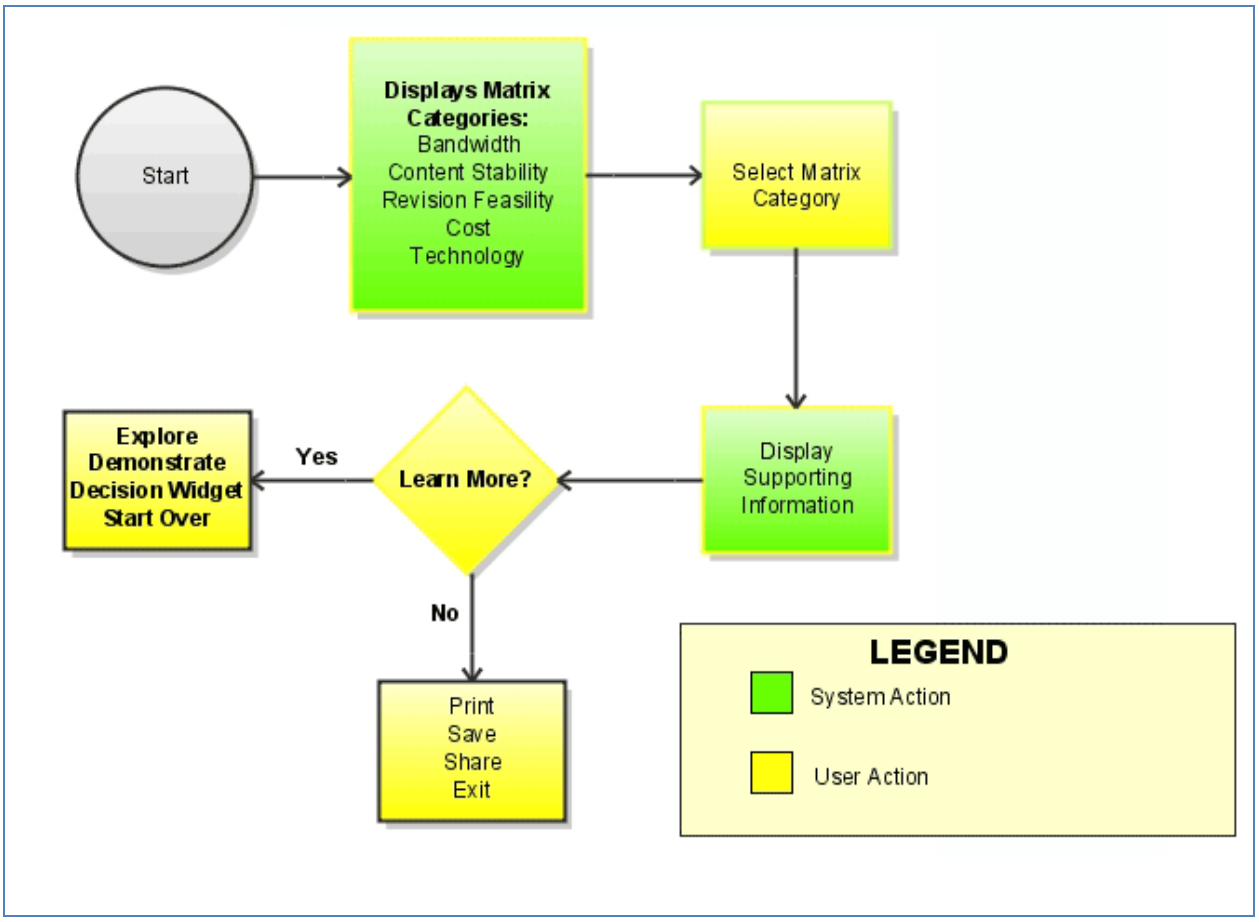

Figure 3: Factors Matrix Flowchart

References

Constantine, L.L., & Lockwood, L.A.D. (1999). *Software for Use: A Practical Guide to the Models and Methods of Usage Centered Design.* ACM Press: New York.

Jonassen, D.H., Tessmer, M., & Hannum, W.H. (1999). *Task analysis methods for instructional design.* Mahwah, NJ: Erlbaum.