Army Research Lab
GIFT Course Creator Wizard Prototype

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Agenda

- Background—GIFT
- Problem Statement
- Supporting Literature
- Steps to Author an ITS
- Heuristic Focuses
- Prototype
- Discussion
- Recommendations

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Background—GIFT

- Computer-based tutoring system
- ITS—intelligent tutoring system
- Uses
- Goals
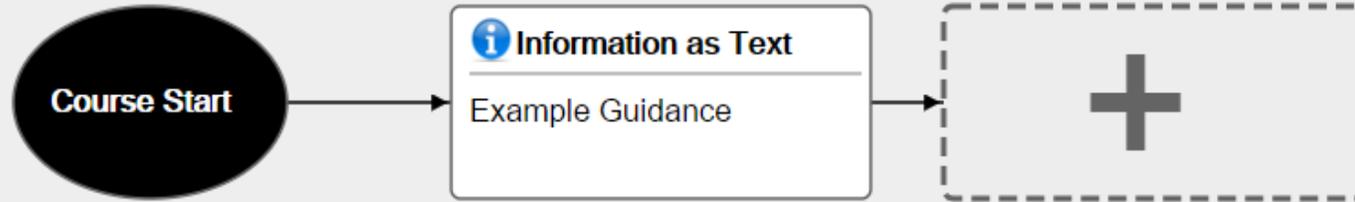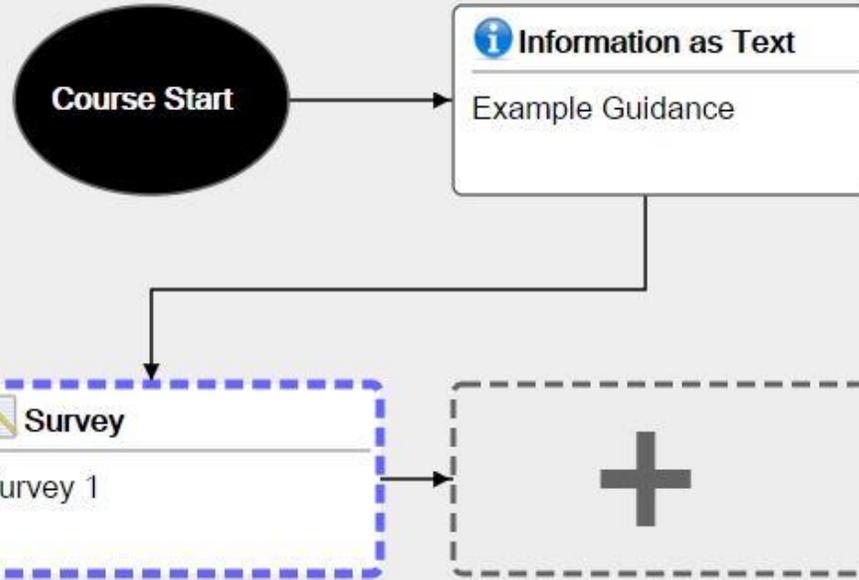
Task

- Develop a structured interview process that elicits information from a user to provide GIFT with the information needed to author an adaptive training course
  - Allow a non-programmer to create their desired course using GIFT and create an effective learning module for users

Supporting Literature

- Nielsen's 10 heuristics
- Shneiderman's eight golden rules of interface design
- Budd's heuristics for website design
- Murray- Authoring intelligent tutoring systems
- Cabada- Authoring tool for developing adaptive and intelligent tutoring systems

Steps to author ITS (Cabada et al., 2011; Murray, 1999)

1. Create the structure of the course and broad concepts
   - -Course goals, concepts, and prerequisites

2. Fill in the course content
   - -Learning style evaluation, media, and learning checks
   - -Utilize the heuristics and rules

3. Map the concepts and tag items that relate in order to help the course flow.

4. Provide a preview of the system.

Nielsen's Heuristics

- Visibility of system status:
  - Progress bar, clear paths, no clutter
- User control and freedom:
  - Directional arrows, ability to skip steps or go back to steps
- Error prevention:
  - Preview at the end, warnings when sections left blank
- Consistency:
  - Format, home and settings buttons

Shneiderman's Rules

- Universal usability:
  - Self-paced process
- Power to navigate interface:
  - Directional arrows, ability to skip steps or go back to steps
- Reduce short term-memory:
  - System fills in blank to prevent user from being overwhelmed

Budd's Heuristics

- Clarity:
  - Concise, clear and meaningful

- Reduce unnecessary clutter:
  - Provide only relevant information

- Provide context:
  - System feedback, step-by-step process

- Positive user experience:
  - Visualizations
  - Attainable goals and rewards

Course Wizard

Version 2017.1.0

Create New Project

Open Project

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Course Wizard

Creator's Information

User Name

Title

First Name:

Last Name:

Email:

Number:

Gender:

Organization:

Save

Course Wizard

Upload Course Image

Name your course

Description

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Course Wizard

Begin course with user/learner evaluation?

Yes

No

| Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Course Eval. | Tags Review | Mapping | Preview |

Begin course with user/learner evaluation?

Yes

No

Course Wizard

Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Course Eval. | Tags Review | Mapping | Preview

Survey Name: survey 1 *

📝 Writing Mode | 🎓 Scoring Mode | ⬆ Import from .qsf | 💾 Save | ⚙ Survey Properties

👁 Preview | ✖ Close

Q1 ☑

I am highly motivated to learn about this topic

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | New Choice
○ | ○ | ○ | ○ | ○ | ○

Q2 ☑

Click here to enter your question's text

○ Click here to enter text for a new choice!

Question Properties

☐ Customize Alignment

☐ Use Existing Column Answer Set

☐ Use Existing Row Answer Set

☐ Required

Help Message

Tag

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Course Wizard

Select a Survey Item...

×

ℹ Informative Text

⊞ Matrix of Choices/Matching

✔ True/False

☑ Free Response

⇌ Slider Bar

★ Rating Scale

☰ Multiple Choice

📄 Essay

⧉ From Another Survey

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Course Wizard

Scoring Logic

Scoring Based On
Knowledge

Possible Total Points
0

Use the slider to adjust the scoring rules (by percentage):

☐ Show Percentages

Novice	**Journeyman**	**Expert**
score < 0 points	0 points ≤ score < 0 points	0 points ≤ score ≤ 0 points

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Course Wizard

List your course concepts

A.

• # add tags

B.

• # add tags

C.

• # add tags

⊕

Save

Course Wizard

Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Mapping | Preview

Drop Down Help Button

List your course concepts

A.

• # *add tags*

B.

• # *add tags*

C.

⊕

• # *add tags*

Save

Course Wizard

List your course concepts

A.

• # add tags

B.

• # add tags

C.

• # add tags

Save

Help

Search Help

Timeline

Adding Tags #

Adding Concepts ⊕

Settings ⚙

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Course Wizard

Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Course Eval. | Tags Review | Mapping | Preview

List your course concepts

A.
- # add tags

B.
- # add tags

C.
- # add tags

(+)

Save

Help ✕

🔍 How does tagging work?

Tagging option on the page will tie into the adaptive course flow option for you the author as you can later go through your concepts and tie it to specific content that will help each individual learn at their own pace. It also helps with mapping your course.

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Course Wizard

Concept A: *(inserts here)*

What are the sub-concepts?

1.

• # *add tags*

2.

• # *add tags*

3.

⊕

• # *add tags*

Save

| Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Course Eval. | Tags Review | Mapping | Preview |

Are there prerequisites for the course?

Yes
No

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Course Wizard

Add Content for Concept A
Concept A description

Upload Media File

Create Text Information

Add Web Resource

Create Learners Checks

Course Wizard

Audio

🎵

Image

🖼️

Choose to Upload

▶️

Video

PowerPoint

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Course Wizard

| Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Course Eval. | Tags Review | Mapping | Preview |

85% Audio – O.B.O.A.T

Upload   Cancel

Audio
🎵

Image
🖼

Audio Upload

Video
▶

PowerPoint
P

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Course Wizard

🏠

| Creator's Info | Course Name | Learners Eval. | Concepts | Sub-Concepts | Prerequisites | Content | Adaptive Course | Assessment | Course Eval. | Tags Review | Mapping | Preview |

Complete   Audio – O.B.O.A.T

| Upload | Cancel |

Audio

🎵

Image

🖼

Audio Upload

Video

PowerPoint

Auditory Learner

Music

Fight Song

 # Add tags
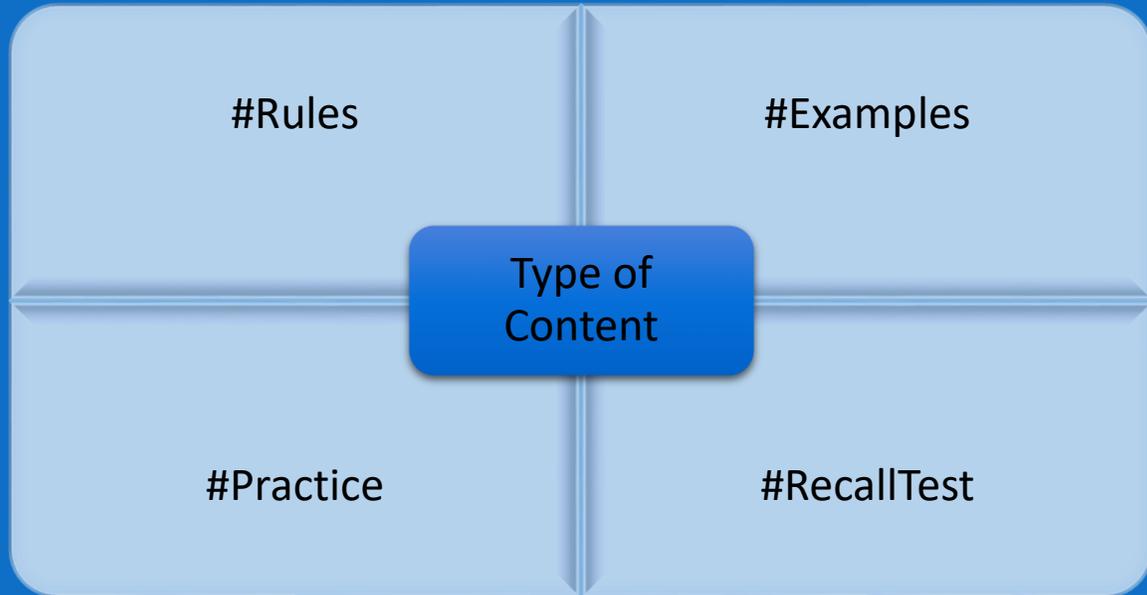
⊕

❮   ❯

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Course Wizard

Content Uploaded: *Audio – O.B.O.A.T*

#Rules

#Examples

Type of Content

#Practice

#RecallTest

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Course Wizard

Content Uploaded: *Audio – O.B.O.A.T*

#Rules	#Examples
Type of Content	
#Practice	#RecallTest

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Course Wizard

Add Content for Concept A
Concept A description

Upload Media File	Create Text Information
Add Web Resource	Create Learner's Checks

Click and drag to organize content

Text: Outline Concept → Audio: O.B.O.A.T → PowerPoint: A → Web: video link → Learner's Check

Next Concept

Course Wizard

Would you like to use adaptive course flow?

Yes

No

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Course Wizard

Would you like to use adaptive course flow?

Yes

No

Creator's Info ▸ Course Name ▸ Learners Eval. ▸ Concepts ▸ Sub-Concepts ▸ Prerequisites ▸ Content ▸ **Adaptive Course** ▸ Assessment ▸ Course Eval. ▸ Tags Review ▸ Mapping ▸ Preview

Which concepts would you like to assess?

A.

B.

C.

Course Wizard

What standard would you like to set to move forward?

Novice

Journeyman

Expert

Scoring Logic

Scoring Based On
Knowledge

Possible Total Points
0

Use the slider to adjust the scoring rules (by percentage):

☐ Show Percentages

Novice	Journeyman	Expert
score < 0 points	0 points ≤ score < 0 points	0 points ≤ score ≤ 0 points

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Course Wizard

Create a Learning Assessment

Course Wizard

Add End of the Course Learner's Evaluation

Yes

No

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Course Wizard

Add End of the Course Learner's Evaluation

Yes

No

Course Wizard

Questions | Score (Low 1-10)

Creator's Info → Course Name → Learners Eval. → Concepts → Sub-Concepts → Prerequisites → Content → Adaptive Course → Assessment → Course Eval. → Tags Review → Mapping → Preview

Questions	Score (Low 1-10)
1. How satisfied are you with the teaching program?	1 2 3 4 5 6 7 8 9 10
2. How confident are you in the material of Concept X? (repeat for all concepts)	1 2 3 4 5 6 7 8 9 10
3. How satisfied are you that the course is meeting the expectation?	1 2 3 4 5 6 7 8 9 10
4. How easy was learning the material?	1 2 3 4 5 6 7 8 9 10
5. How motivated were you to learn the material?	1 2 3 4 5 6 7 8 9 10
6. Overall how satisfied are you with this GIFT course?	1 2 3 4 5 6 7 8 9 10

Add Question ⊕   Save

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Creator's Info	Course Name	Learners Eval.	Concepts	Sub-Concepts	Prerequisites	Content	Adaptive Course	Assessment	Course Eval.	Tags Review	Mapping	Preview

Review & Add Tags for Mapping

A.

- # List tags

B.

- # List Tags

C.

- # List Tags

⊕

Save

Course Wizard

Map it together (Click and Drag)

Concept A

Concept B

Concept C

Concept D
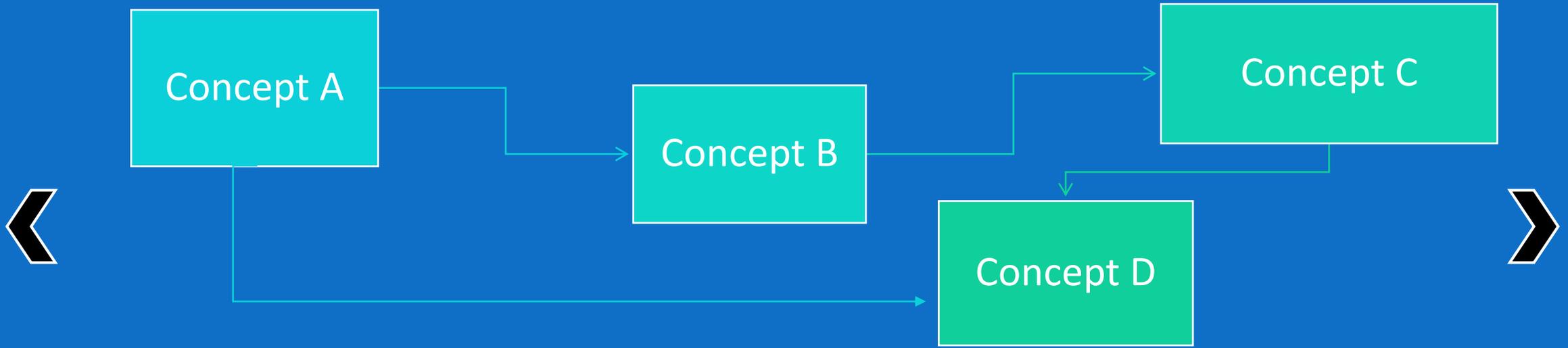
Add Connecting Arrow

Course Wizard

Launch Preview

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Discussion

- Current system:
  - learning curve
  - Unstructured order for users

- Wizard:
  - Minimizes time learning system
  - Walks users through creation
  - Aims to raise user confidence in system
  - Mapping concepts similar to current

- Bridging gap of mental model and ITS:
  - Rather than give user blank slate, walking them through it "maps" it out for them similarly to how they would expect the course to run

Recommendations

- Implementing this system in place of the current authoring system will enhance GIFT

- Future research:
  - Implementing standardized learning-style tests that map course for user
  - Enhance algorithms to automate this process and automate the mapping for given responses
  - Further automation and consistency will enhance learnability and user experience

- Full heuristic-evaluation of the prototype

- Enhance prototype with more technical considerations and means

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