GIFT Course Creator Wizard

Savannah Murray, Christina Pico, Kirsten Redmon, & Charles Rowan
United States Military Academy at West Point
Behavioral Sciences & Leadership

INTRODUCTION

The Generalized Intelligent Framework for Tutoring (GIFT) is a computer-based tutoring system (CBTS) framework aimed at increasing the ability to conduct self-regulated learning in the Army (Sottilare, 2012). GIFT can be used to author tutoring systems and CBTS components, manage instruction of selected tutoring principles, and to analyze effectiveness of the CBTS. For example, rather than sitting Soldiers in a classroom and teaching them about Combat Life Saving strategies, GIFT allows the commander to create an adaptive online course and allows the Soldiers to take this course at their own pace. In this paper, we are concerned with the authoring of an Intelligent Tutoring System (ITS) in GIFT—specifically with the potential to create a Wizard that will allow users to create a course in an expedited and user-friendly process. We will begin by providing background on GIFT's current authoring system and explain how ITSs' function. Next, we will describe heuristics accounted for and human factors components to consider. Finally, we will discuss the process of determining steps to author an ITS, present our prototype and explain how it can be implemented in GIFT to improve the system.

Literature Review

GIFT is designed to allow user feedback to dictate the system behavior, such as repeating certain learning modules if users underperform on the assessment, or prompting the user for more information regarding learner's state (Sottilare, 2012). Combining adaptive hypermedia and ITS's creates an adaptive ITS (Phobun, 2010). The adaptive ITS allows for a more personalized tutoring system for the user. Additionally, pedagogical models are important to consider when developing an adaptive ITS. Learning is a highly individualized process and, as such, should be adaptable to best fit each student. The ITS should adapt to learner ability, goals, and prior knowledge. In GIFT, this can be either set to the default setting or a customized system determined by the developer. In an adaptive ITS, there is a need for the system to collect data, analyze it, and use that data to improve the learning process (Bicans, 2015). Adaptive tutoring allows authors to individualize the student's experience to fit their individual needs.

The current authoring process in GIFT is user-centric, allowing the user complete control over the creation of their course in an affordable and simple process (Sottilare, 2012). The domain-specific knowledge in GIFT includes both authoring new elements as well as reusing previous ones—such as learning objectives, media, tasks, performance measurements, and concept maps. While this allows users freedom, it also provides users less constraints and prompts along the process than an automated process, such as a wizard, would. Among GIFT's authoring goals are decreasing the effort and skill threshold for authoring CBTS, developing and exploiting common tools and interfaces, and developing interfaces that are able to be widely used (Sottilare, 2012). Keeping these goals in mind, we created a structured interview process that allows the average, "non-programmer" to create their desired course using GIFT and create an effective learning module for users (Murray, 1999).

Heuristic evaluations are simple and helpful ways to find usability issues in a user interface design (Nielsen and Molich, 1990). Using heuristics is an efficient and affordable way to improve usability of a product. To create a user friendly product, authors must ensure that their interface is easy to learn, is accurate, productive and affordable. Using heuristics is also a cheap and affordable way for authors to test the usability of their product and receive precise and accurate feedback from users (Nielsen, 1992). When developing an ITS, it is important for users to be able to learn and memorize the interface design. Users who are able to quickly learn the interface will become more efficient thus resulting in more use of the interface (Nielsen, 1996). Nielsen's nine heuristics for user interface design stress detail focused errors within an interface. For the creation of the Wizard, we focused on four heuristics that are the most important for the ITS. First, visibility of system status, keeps the user informed on what is going on within the interface (Nielsen, 1995). The second, user control and freedom, allows the user to correct their mistakes. The third is consistency and standards; the interface should use the same language and display throughout the interface. Next, error prevention gives users clear signs that they are not performing a task correctly and the tools to fix that error. This means that irrelevant or extra information is ignored by the user. Finally, the interface should help users recognize and recover from errors. These guidelines will help us mold the ITS in GIFT into a more user friendly system.

Another use of interface design rules for the ITS system are Shneiderman's eight golden rules of interface design (Plaisant, & Shneiderman, 2010). Similar to Nielsen's nine heuristics, using Shneiderman's rules, we will be able to further evaluate and determine user productivity through these rules. When designing an interface, authors must consider the following of Shneiderman's rules: universal usability, power to navigate the interface and reduction of working-memory load. Users should be able to move within the interface at their own pace. To support locus of control, the user should have the power to navigate the interface. Reducing working memory load allows the system to fill in the blanks and to keep information in the system to prevent the user from becoming overwhelmed. These rules will help us create an easy to read and self-paced interface.

Additional heuristics emphasized in the creation of this wizard were developed by Budd specifically for website evaluation and focus more on information content than Nielsen's heuristics (Budd, 2007; Preece, 2015). Budd's first heuristics for websites is clarity—making the system concise, clear and meaningful. Next is the need to minimize unnecessary complexity and cognitive load, which removes unnecessary clutter by prioritizing important aspects with size, color, and alignment. Additionally, Budd stresses the importance of providing users with context in the form of navigation, feedback, "breadcrumb trails," or showing the steps in the process. Finally, Budd's heuristics emphasize the need to promote a positive user experience through use of attainable goals and rewards. Among these rules listed above, we see a common trend of creating an aesthetic appeal that signals users to the key areas of the interface, providing them with some level of context concerning where they are in the product, and reducing user workload. The rules most pertinent in our prototype are those centred on these ideas as well as maintaining user control while reducing workload. Taking into account Nielsen's heuristics, Budd's principles for website design, and Schneiderman's rules for interface design help guide our development of this prototype and create a usable and efficient product—the GIFT Course Creator Wizard.

METHOD

In creating the GIFT Course Creator Wizard, we first identified different methods and steps involved in creating an ITS. There are various schools of thought regarding the authoring of an ITS. Combining different approaches, we were able to synthesize our approach and determine a set of steps to follow in the creation of our interview process. While Cabada et al. (2011) breaks down the authoring process into two phases: specification of requirements and determining learner contents, Murray (1999) breaks the process into four main components: student interface, domain model, teaching model, and the student model. We synthesized these approaches to provide our general framework for authoring an adaptive ITS. Our first step was to create the structure of the course and broad concepts, to include course goals, concepts, and prerequisites. Step two was filling in the course content, such as pedagogical data, tags, media, and learning checks, utilizing the heuristics and rules described previously in this paper. Next, we mapped the concepts and tag items that relate in order to help the course flow. The fourth and final step in our process was to provide users with a preview of their system.

Murray’s and Cabada’s articles provided the basic framework for our methods. Murray’s four components detail specifics on the creation of an ITS. In the student interface developers must consider which graphics and tutorials to use, as well as analyze usability and clarity (Murray, 1999). This includes heuristic evaluations, such as Nielsen's heuristics introduced previously. The domain model of an ITS includes curriculum knowledge, simulation models, and problem solving. The domain module is where the instructor will implement specific content tied to their course and create the structure of the system and define the goals and concepts.

In the GIFT Course Creator Wizard, populating the domain module is one of the first steps a developer completes. The order in which the steps were presented to the author were based on questions that guide the user to first input general information, such as personal information, then the author can input specific information based on the course that they want to create. We did this so that the Course Creator Wizard would flow in a logical order and the user would not get confused during the process. Pedagogical content knowledge identified through a state-based assessment completed by the learner that provides recommendations, which are then generalized and implemented in the domain module. The pedagogical knowledge options allow developers to use a predefined learning path, as described by Bicans (2015), or to create a customized approach, depending on their course needs. The curriculum knowledge category is where ITS developers account for varying levels of interest or subject importance to determine the appropriate course of action for each user. This is tracked with tags for the students’ dominant learning style. We incorporated this into the GIFT Course Creator Wizard by allowing developers the option to create an initial survey to measure motivation, previous knowledge, and other factors deemed important to the developer. We also incorporated tags by creating a tag system that will couple topics together at the mapping stage and suggest an appropriate course map based on similar tag inputs throughout the process. By suggesting these tools to developers, we allow them to group their methods by topics, motivation levels, difficulties, or whichever other factors they deem important.

Cabada (2011) further describes how developers must specify links between content, consider students’ different learning styles and account for that in the personalization aspects. By using various tags to map different students through appropriate methods, our Wizard will achieve this effect. Murray’s simulation models involve joining components together and authoring rules and constraints concerning these junctions (Murray, 1999). In GIFT this incorporates the adaptive course flow options to map concepts together—such as the suggested mapping page and the user-controlled mapping page at the conclusion of the Course Creator Wizard. Developers can then include specific expertise—measured by learning checks and prerequisites—such as various knowledge, problem solving processes and procedural expertise (Murray, 1999). Specifying tutoring strategies and determining the range of flexibility given to the user allows adaptive tutoring systems to continue to grow and provide feedback to the system (Murray, 1999). We took into consideration that the authoring process must be considered for both flexibility—breadth and depth—and usability—learnability, productivity, fidelity, and cost—when considering tradeoffs in design.

For the creation of our Wizard, we first considered Murray’s (1999) questions:

- How much should the author be constrained to a particular (favored) pedagogical model?
- Who are the prototypical authors who will use the system?
- What types of knowledge and skills should be modeled by the system?
- What is the source of the teaching and domain experience?

These questions helped to steer our initial interview process for ITS authors. We used these to shape our questions, creating more structured questions that would steer the development of their specific course. We sought to make the current GIFT processing more automated through use of a wizard. Understanding that

GIFT is created by the Army Research Lab and primarily will be used in military training, we focused on basic Army training courses and prerequisites to various schools. With that in mind, we looked to create a course that allowed developers—presumably commanders or school instructors—freedom to design in a similar way that they would teach the material, while still constraining them to common pedagogical strategies.

In GIFT, the typical user is not a programmer and therefore we wanted to walk them through the process more than the current system allows. In creating our questions for our Wizard we knew we wanted to guide the author from a broad idea or concept of a course towards specific goals. Then, assuming the authors have content—such as media, quizzes, or other text-based tools—we aim to match this content to sub-goals. We decided to add tags on every piece of content in order to allow authors to track their various concepts and goals as they continue to add to the course. We allow users to add learning checks, assuming they will want to test the effectiveness of their model. The mapping section is where users can control the order of display because most users may not add content in the exact order they wish to present it in. The tags allow an additional method for authors to group their concepts once they arrive at the mapping page of the wizard. Throughout our creation, we consistently put ourselves in the position of authoring an ITS and sought to answer any questions that arose when we attempted to create a course using the current GIFT system.

RESULTS

We created the prototype using Microsoft PowerPoint. Our prototype enhances the user experience by reducing the uncertainty in the course creation process. We walk the user through the steps to author an ITS and prompt them to consider many different options to add to their course—such as media, learning checks, and course mapping to fill their course, as well as providing them the option to add additional materials they feel necessary for their course. Figure 1 shows our content page of our Wizard. The tagging option ties into the adaptive courseflow option for the authors as they can later go through their concepts and tie it to specific content that will help each individual learn at their own pace. This makes it easier to upload personal information and media pertinent to the users' course development and it allows the user a visual of their progression. Following uploading the content, the user then sorts the content into one of the four quadrants—rules, examples, practice, or recall—which adds additional use for the tagging options. The user is prompted for more information until they are satisfied with their course. A user can choose to leave content blank and skip ahead, however, the first time they choose to do so the wizard will prompt them with a notice that they are leaving content blank, while allowing them to disable the reminder for the future.

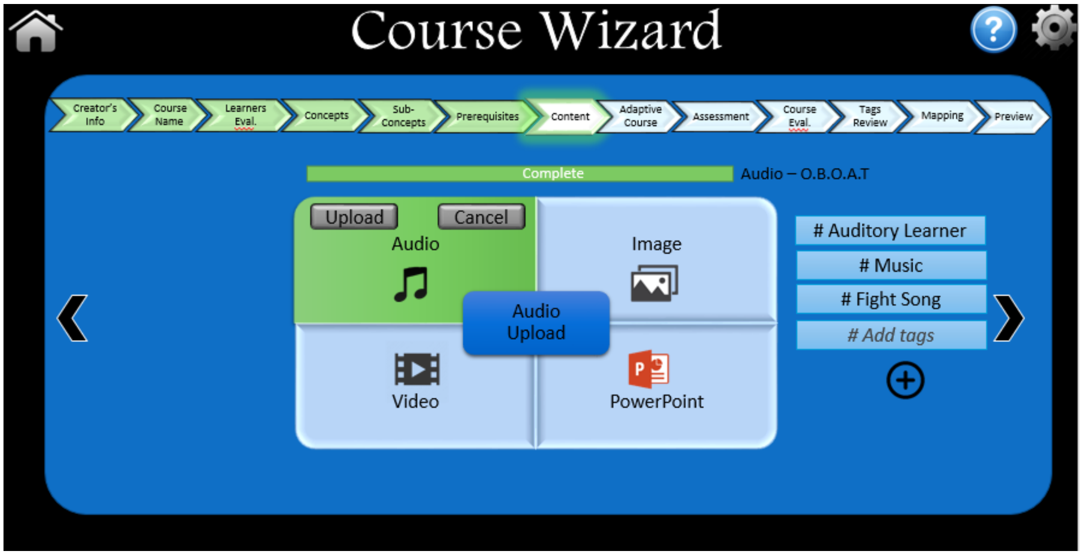


Figure 1. Content Page for Course WizardContent Page for Course Wizard presents the users' progress bar at the top. The tagging options are presented to the right of the various media input types. The user can upload various types of media that are used to build the personalized course.

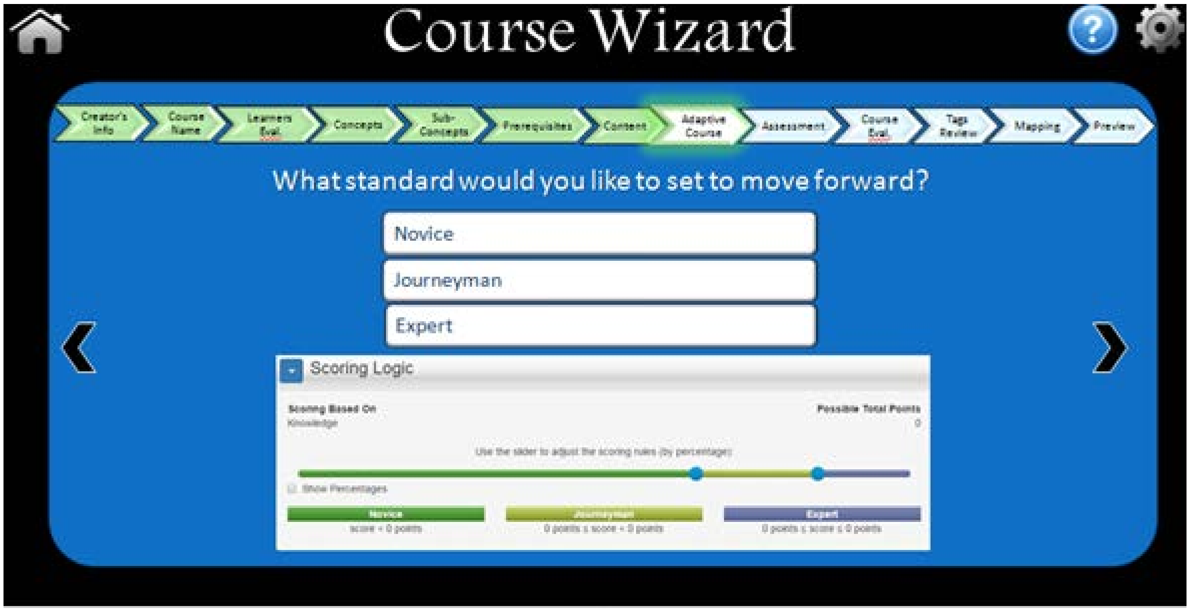
The Wizard will help users individualize each course for its users. Much like GIFT, the GIFT Creator Wizard collects data, analyzes it, and uses that data to improve the users' learning process (Bicans, 2015). This also allows users to have control of their course without time or cost constraints (Sottilare, 2012). As previously stated, learning is highly individualized, with this Wizard users are given the freedom to add, delete or move concepts to fit their needs while using this ITS system. This ensures that users with very little experience can have success while constructing their own learning module (Murray, 1999). By reducing the process required for new users to become familiar with the system, GIFT can be more quickly learned and therefore improve the effectiveness of the system.

In creating this prototype we focused on Nielsen's heuristics of visibility of system status by adding the progress bar at the top of the page to inform the users of their progress, what they have completed, and what they have left (Neilsen, 1995). Prompting for novice users to give the current system state will facilitate the human in the loop process in order to reduce confusion and increase awareness of the tutors progress. Users maintain control and freedom with the forward and back arrows on the left and right sides of the screen that will allow them to course correct or skip any areas that they deem irrelevant to their particular course. However, we maintained error prevention, consistency and standards with the preview available at the end. The preview function presents the course authors with a user-view of the course and allows them to view the course in a partial-edit mode where they can toggle between editing and the user-view of the course.

We further enhanced user freedom by allowing authors to transfer their work to the current authoring interface once they have completed the Wizard tutorial. This will optimize user control and freedom as well as allow an additional interface in which authors can edit with more freedom once they understand the system. Maintaining visibility and system status by showing clear paths and removing clutter. We emphasized consistency in creating our Wizard. The home screen and settings screen stay consistent throughout. We also allow developers the option to choose the default pedagogical model or create a default model based on their specific goals. The algorithms of the website will run diagnostics and analysis, such as those mentioned in Bicans (2015), to provide the user feedback on their progress. We also adhered to Budd's (Preece, 2012) heuristics by designing our prototype with as little clutter as possible and using a simple layout. The simple appearance with solid colors enhances clarity for the users and provides the user with context according to Budd’s heuristics. We used traditional icons for the setting and home button and placed a progress bar at the top of the page where the user can easily find it. Finally, we prompted the developer to create goals and feedback for the student to enhance student experience.

The appendix shows a complete list of questions asked throughout the Wizard to assist users along in the process. In developing the questions we used in our Wizard, we started by walking through the current authoring system on GIFT. We decided that starting broad with our questions, beginning with asking them the goal of their course and then concepts within the course, encourages authors to create and follow a structure for their course. From there, we prompted users to input specific media, texts, or tests they may have to enhance their course. We operate under the assumption that the user comes to create a course with a general idea of what they wish to accomplish and we simply aim to guide them in that process. Suggesting course evaluations—both before and after taking the course—and prerequisites for the course allows the author to consider evaluation methods to ensure they receive feedback on the effectiveness of their course as well as prompting the system as to which pedagogical method to use for the specific user. Finally, by implementing a mapping system we encourage authors to connect their ideas for the course in a manner that fits their goals.

We utilize mapping and tagging methods to enhance the adaptive courseflow. Figure 2 shows how the authors are prompted to give their standards for moving on from one concept to another. Having presented the system with tags on each piece of content lays the foundation for the adaptive courseflow to correctly draw material that a user needs additional practice on. Media and concepts tagged similarly will prompt the system to show the correct tools to users when retraining based on the learning checks. This will be a key process in the adaptive courseflow. In order for this process to work, creators must tag media, concepts, and learning check questions appropriately and map their course consistent with their goals. The algorithms and process GIFT uses in adaptive courseflow remain the same; the changes occur at the user level. They will be prompted to give specific ties between concepts and content in order to enhance the courseflow and reduce any guesswork from the process. Authors will be prompted to give specific ties between concepts, media and learning questions in order to ensure the student receives proper retraining. Once the learning questions determine a student’s ability, the adaptive courseflow will determine the next step the student goes to. If they are consistently struggling with one concept, they course will automatically return them to that concepts learning content until the student is able to pass the learning questions. The threshold for moving on is set by the author and will determine when a student retrains before moving to the next concept. Additionally, authors can emplace a variety of questions and randomize the order to ensure students are not memorizing questions rather than learning concepts. The adaptive courseflow ties concepts, media and questions together and presents students with tools they need to complete the course based on their responses along the way.



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
score < 0 points

Journeyman
0 points ≤ score < 0 points

Expert
0 points ≤ score ≤ 0 points

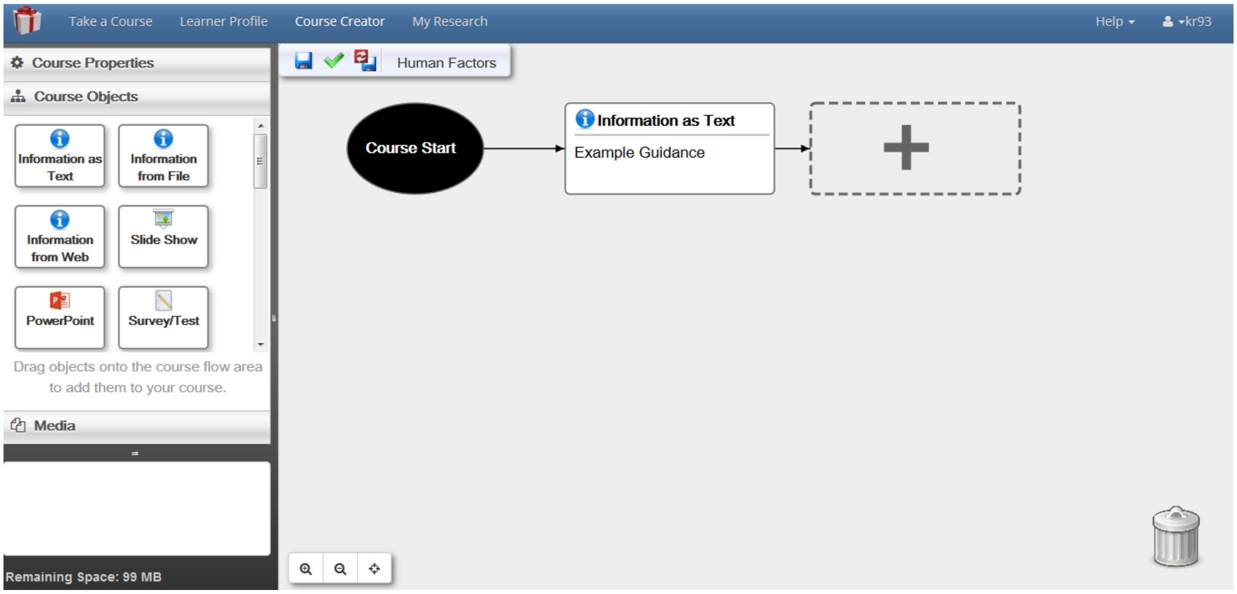
Figure 2. This screen shows the options for adaptive course flow presented to authors as they determine the standards for users to move forward in the learning module.

Transitioning from the list of questions to creating a prototype, we found arranging the questions in order to be fairly natural and intuitive—following the general order one would expect a conversation to go. By placing ourselves in the position of the authors, we found that we were able to follow a logical pattern for our questions. This prompts the user to continue moving through the Wizard. Like Bican (2015), the adaptive wizard arranges and adapts to the user's ability, goals, and prior knowledge. With this more structured process of adapting and analyzing user information, the GIFT Course Creator Wizard, keeping with the same ideas of GIFT, allows first time users to create their desired course using GIFT and create an effective learning module for users (Murray, 1999). In this process, we followed Nielsen's heuristics to design our prototype, making the steps we needed to follow to make it usable intuitive as well. In accordance with Nielsen's heuristics the wizard is based on the usability issues identified in the current GIFT system (Nielsen, 1995). This makes it easier for the users to navigate and gives the users a step-by-step introduction to the new system.

DISCUSSION

The current GIFT system allows the users freedom to create courses in whichever manner they see fit. The advantages to this include following Nielsen's heuristics of user control and freedom, and flexibility. However, the current system is complicated and has a learning curve associated with it. Additionally, the high degree of user freedom presents the tradeoff of a lack of suggestions for course development. Figure 3 shows the blank GIFT Course Creator. Rather than present users with options, the current system lays out all the capabilities and allows users to choose from the list. Users start with a blank screen with many options on the side, but there are no prompts to tell them along the way where to go from where they are. This does not guide users in developing their course and leaves room for error as they navigate the page. While the side bars present options for where to go next, the order in which the user gets there is not well structured and may require trial and error for the user to understand the process. If GIFT implemented this Wizard to present users a more structured approach to course creation, especially for military personnel designing for training purposes and predetermined course goals, the user would be able to create a more appropriate course flow and create a course that adequately trains the required material.

The versatility of the design capability of GIFT lends itself to be a functional application across various fields. This prototype can be used for application of elementary to graduate level civilian education, as well as technical schools. While the primary focus of our efforts was for use in military environments—primarily for use by commanders in situations requiring pre-training in place of traditional classroom instruction—it can easily be applied to a variety of uses. Since content drives function, application of GIFT is only as limited as the content the author uses. For example, if paramedics utilize GIFT for training, the author will choose media and content specific to paramedic training. Expanding the functionality of GIFT stresses the importance of having an interface that is intuitive and does not create a burdensome increase in time or resources in order to learn the system. This speaks to the importance of our project as we strive to bridge the gap between user expectation and performance.



Drag objects onto the course flow area to add them to your course.

Remaining Space: 99 MB

Figure 3. GIFT Course Creator for the current method. The options for users to choose from are shown on the left column as an option-bank as opposed to a prompt as the wizard would present.

The GIFT Course Creator Wizard is an easier variation of GIFT and it allows users to minimize their time spent learning how to create a course. The ability for the author to upload material as prompted, tag it with their concepts and sub-concepts, and map it as they see fit greatly reduces the user’s mental workload, fitting with our heuristic suggestions. The steps necessary to uploading information and course development are easy to follow for the user and the user will be able to correct their mistakes. The general layout of the Wizard is the same as the current GIFT system. This familiarity gives the prior users more confidence when navigating the Wizard. The Wizard also implements the survey-like format of GIFT which makes navigating through the Wizard easier for the user. Mapping concepts from GIFT are also included in the Wizard, however, with the Wizard users do not map as they go, but rather create and upload as they go and then map at the end. Mapping at the end allows users to focus on each concept individually as they upload content for each concept, and then focus on the bigger picture at the end. Mapping together concepts gives the author a chance to better visualize their course and control the direction they wish to take it. Here, we adhered to Nielsen’s heuristic by allowing users to maintain control of the mapping. To ease use of both the Wizard and GIFT, users can access the GIFT library and upload information through the Wizard. However, users can also upload straight to the Wizard. To make creating a course more individualized, we included a learner's evaluation—a set of questions that allow the user to identify how they learn best. This will be incorporated in the adaptive learning as it is in the current GIFT process to help steer the direction of the courses. This evaluation is another tool for users to monitor their learning style and individualize their learning process.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Recommendations for Future Research

GIFT provides users an effective method for creating courses utilizing ITSs and allows users many advantages in their creation. However, the system could be improved with the implementation of a more structured process for users to create their courses. The GIFT Course Creator Wizard allows users the freedom to design the course the way they wish to, while also providing the structure necessary to walk users through creation and steer them towards a more student-centric design. Implementing this system in place of the current authoring system will enhance GIFT. To further enhance this system, future research should include research into the various pedagogical methods in relation to ITSs in order to make the system most effective for all users. Additionally, further developing the pre-determined learning-style questionnaire to drive the adaptive courseflow of the course would be of benefit to the authors and the students using GIFT. While this is an option now for users to create on their own, implementing this into GIFT as a standardized function and standardizing the algorithm behind it would create consistency of use. The Wizard would then be modified to present authors with different scenarios in which they would create content for highly motivated, highly unmotivated, and users in between. Creating a standard, automated system to present various types of material based on interest level would create more consistency throughout the system. The Wizard can be further developed to walk authors through by creating many different options for various learner-motivation levels.

Our prototype provides the framework for a Wizard system that synthesizes different methods in authoring an ITS. Future research should investigate the recommendations in this paper to evaluate the design and continue iterating on its structure. Specifically, we recommend usability tests consisting of creating a specific course and compare to current method between novice users and then between expert users to determine if there is an ideal method for either group. Additionally, usability testing should include participants from various populations that may use GIFT. This would include populations such as military commanders, civilian educators from elementary to graduate levels, and technical school instructors. We hope that this Wizard can be implemented and used to simplify the process of creating a course in GIFT and further developed and enhanced through the above methods.

The Wizard can be further developed to account for various learning styles, motivations, and beginning knowledge by prompting users to create content for various levels for each of these factors. This would guide authors in making their course more individualized in a simpler way as the Wizard would prompt them to account for these levels. If GIFT standardizes their learning questionnaire and levels for each motivation, the authors would then just need to be presented with the levels to fill in content. For example, the Wizard would present the author with a prompt to create content for a highly motivated visual learner and then an unmotivated auditory learner. The reason this is not in the current Wizard is because the standards for this process are not standardized from GIFT yet, making it too individualized to prompt users to create for each category. For that reason, we recommend making this change before implementing the Wizard, and then account for that change when implementing the Wizard by prompting users for each level and style and motivation when uploading content for each concept. Designing the Wizard to be more automated and consistent will enhance learnability as well provide a more enjoyable and stress-free experience for the users.

Conclusion

The GIFT Course Creator Wizard is a user friendly, self-regulated learning system that provides accurate feedback to the user. This system will adapt to the users' learning style, learning ability, prior knowledge and their individual goals for the course they are interested in. This is important because it allows the user control of their own learning while using an automatic system. To develop this system, we used heuristics for website evaluation and identified usability errors in the system and interface design. In the prototype, we focused on visibility, user freedom, consistency, and error prevention. These heuristics contribute to the users learning and productivity while using this system. The current GIFT system is not as user friendly as the Course Creator Wizard, however, if the current system is implemented, users may be more willing to continue using the course creator and it gives users a more structured advance in creating a course. The user is able to easily navigate through the Wizard by following the steps provided while monitoring their progress. The consistency of each page of the Wizard prevents confusion from the user, and expedites the process of creating a learning module. The easy to use, step-by-step process of the Wizard mitigates the possibility of errors caused by the user by confirming each step that the user completes. Using Murray's (1999) four components of authoring process and Cabada et al.'s (2011) two phases of authoring process we developed the Wizard to meet the needs of the user to provide a better base to customize and individualize a specific course. The goal of the Wizard is to allow authors to create a course with freedom and ease of use, while also presenting them with a guide to follow. GIFT course creator increases efficiency by reducing errors, reducing confusion and reducing redundancy, while allowing users to accomplish goals of ITS faster. The Course Creator Wizard encourage users to use the system and increases usability which leads to an increase in compliance rates.

When creating our Wizard, we took into consideration flexibility of system for the user, usability, learnability, efficiency, fidelity, and cost.We determined these components are most important in the creation of this user friendly Wizard. For the Wizard's course material, we created the structure of the course and broad concepts, filled in the course content, mapped the concepts and tagged items related in specific order to help the course flow, and provided users with a preview of their system. These steps allowed us to develop a personalized system that anyone can use and users will not get confused about which step they are on. In the future, the Wizard can be enhanced with a standardized adaptive courseflow that will prompt users to add content for various levels of user interest and knowledge for each learning style. This will enhance GIFT as users will have a clear idea of how to personalize their course for a variety of students. The preview allows authors to fix what they missed or are not satisfied with if the preview is not what they wish for their course. The GIFT Course Creator Wizard gives the users full access to refine user learning in a more consistent manner and can be a great asset for GIFT in the future.

The adaptive courseflow in the Wizard helps guide and retrain the user on what they know and what they do not know. This adaptive courseflow helps with efficiency and learnability. The user will be more likely to retain information that they previously needed to practice. This system can be implemented in the military to allow officers to effectively teach basic soldier skills. In the future, we hope the Wizard will be implemented in the current GIFT system and that the current GIFT system will be simplified to help with user efficiency and learnability of the GIFT system. The GIFT Course Creator Wizard is an effective way to allow users the structured freedom to create and individualize their preferred course without confusion or requiring a large amount of time spent learning the system.

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Appendix: Prototype Interview Questions

1. Create New Project or Open Project?
2. Author Name?
3. Photo for profile
4. Job Title of Author?
5. Name of Author?
6. Email of Author?
7. Contact number?
8. Gender of author?
9. Organization?
10. Course name?
11. Course image?
12. Course description?
13. Would you like to begin course with user/learner evaluation?
14. Please list course concepts & tags
15. What are the course sub-concepts (& tags)?
16. Are there prerequisites for the course?
17. Add content for concept ___
18. Would you like to use adaptive courseflow?
19. What concepts would you like to test?
20. What standard would you like to set for moving forward?
21. Create a learning assessment
22. Would you like to add end of the course learner's evaluation?

    If yes:

    a. How satisfied are you with the teaching program?
    b. How confident are you in the material of Concept ___?
    c. How satisfied are you in the course in meeting the expectation?
    d. How easy was learning the material?
    e. How motivated were you to learn the material?
    f. Overall, how satisfied are you with this GIFT course?
23. Are there any other tags to add before mapping?
24. Map the course together
25. Preview course?

ABOUT THE AUTHORS

Savannah Murray *is a senior cadet at the United States Military Academy. She is studying Engineering Psychology in the Behavioral Sciences and Leadership department. Upon graduation in May 2017 she will commission as a Second Lieutenant in the Ordnance Branch.*

Christina-Maile C. Pico *will be a graduate and Commissioned Officer in the U.S. Army as an Engineer in May 2017 from the United State Military Academy at West Point. While at the academy Pico majored in Engineering Psychology.*

Kirsten Redmon *is a senior cadet at the United States Military Academy. She is studying Engineering Psychology in the Behavioral Sciences and Leadership department. Upon graduation she will commission as a Second Lieutenant in the Engineer Branch.*

Charles Rowan *is a Major in the Simulation Operations functional area of the United States Army. He is an assistant professor in the Engineering Psychology Program in the Department of Behavioral Sciences and Leadership.*