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**ADVANTAGES OF USING USER EXPERIENCE DESIGN CONCEPTS IN THE CREATION  
OF E-LEARNING COURSES**

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## **ABSTRACT**

This work focuses on the advantages of the application of User Experience Design concepts in the creation of e-learning courses showing how Instructional Designers can benefit from its application to improve the learning experience by following some of the rules and conventions for good website design. It starts by covering the definition of the term User Experience Design providing background information about the authors who have popularised the term, explaining its association with Usability, going through the advantages of applying it to e-learning courses, and ending with a practical application of the concepts. The practical component of the work lays on the assessment of a course to identify the elements that can be improved following the User Experience Design concepts found in the literature review and the application of those same concepts to a makeover of the original course that then allows the comparison of the two versions. Several elements in the original version were identified as needing improvement: blank space, lack of visual elements, navigation, clickable items, placement of the logo, responsiveness to different screens, and aesthetics.

The course makeover was built using the authoring software Articulate Storyline that allowed the development of a version that promotes a better experience to the learner by reallocating some items, enhancing fonts and buttons, making it adjustable to different screen types, and modernising its layout.

This work tries to prove that Instructional Designers can certainly benefit from applying User Experience Design concepts to help them identify some issues that otherwise could not be easily detected by simply following Instructional Design models.

**Keywords:** e-learning, instructional design, usability, user experience design

## RESUMO

Este trabalho debruça-se sobre as vantagens da aplicação dos conceitos de User Experience Design na criação de cursos e-learning demonstrando como os Designers Instrucionais podem beneficiar de sua aplicação para melhorar a experiência de aprendizagem, seguindo algumas das regras e convenções base para um bom desenho de websites. Começa por abordar a definição do termo User Experience Design fornecendo informação histórica sobre os autores que o popularizaram, explanando a sua associação ao termo Usabilidade, passando pelas vantagens da sua aplicação em cursos de e-learning e terminando com demonstração da aplicação prática dos conceitos.

A componente prática do trabalho consistiu na avaliação de um curso existente online para identificar os diferentes elementos que poderiam ser melhorados seguindo os conceitos de User Experience Design encontrados na revisão de literatura e aplicando desses mesmos conceitos numa nova versão do curso, permitindo-se adicionalmente a comparação entre ambas as versões. Na versão original, identificaram-se os seguintes elementos com necessidade de melhoria do ponto de vista de experiência do utilizador: espaço em branco, falta de elementos visuais, navegação, itens clicáveis, posicionamento do logotipo, responsividade do conteúdo a diferentes ecrãs e estética geral.

A reformulação do curso foi desenvolvida com o software de autoria Articulate Storyline que possibilitou o desenvolvimento de uma versão que promove uma melhor experiência de aprendizagem através da recolocação de alguns itens, aprimoramento da tipografia e botões, maior adaptabilidade do conteúdo a diferentes tamanhos de ecrã e modernização do layout.

Este trabalho mostra como os designers instrucionais podem beneficiar da aplicação de conceitos associados ao User Experience Design, demonstrando em que medidas estes o podem ajudar a identificar alguns problemas que, de outra forma, não seriam facilmente detetados apenas seguindo modelos associados ao Design Instrucional.

Palavras-chave: e-learning, instructional design, usability, user experience design

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## INTRODUCTION

This project aims to demonstrate how applying concepts of User Experience Design (also known as UXD) to Instructional Design, may help deliver a better experience to the user, hereafter referred to as learner, in the completion of e-learning courses.

From a learner perspective, it is often noticeable that, in terms of content availability and usability, different e-learning courses offer different experiences in distinctive digital environments, whether these are more traditional text-based courses or enhanced with multimedia content.

The learning experience can vary significantly based on the learning platform layout, the syllabus organization, the length of the course and its subdivision, the media elements chosen (videos, illustrations, audio, documents, external resources), the use or absence of gamification techniques, the hardware and system requirements (e.g., microphone required), etc. All of these seem to play an important role in the learning experience.

An Instructional Designer or anyone developing e-learning courses can benefit from understanding User Experience Design concepts, as they may help designing courses to provide the best learning experience possible, knowing that such experience will have an impact on the learners' motivation to attend it, their will to return, their ability to keep focus, to be engaged and retain knowledge. Having these considerations in mind, it can be stated that is very important to look at the course design process from a User Experience perspective.

The next chapters will help understanding how both design disciplines – Instructional Design and User Experience Design - can work together and how e-learning designers can leverage e-learning courses, by looking at an example of a course makeover applying User Experience Design concepts to further improve the learners' experience.

A big part of this work has been done based on information provided in Steve Krug's book "Don't Make Me Think" which is considered, by many, one of the most important books



on User Experience, together with “The Design of Everyday Things” by Donald Norman. The reason why I have chosen the first is that it is more website and user interface oriented than the second, being more relevant to the project for the fact that the users should be familiar with website navigation already.

In this work, I have opted for assessing an existing course that has been identified by a community of e-learning designers as a course needing a “makeover” and developed it applying the most central concepts of User Experience Design.

Since one of my concerns was to keep the course structure by copying the text word-by-word and maintaining the exact number of course pages, I lost some flexibility to create something substantially different. Nevertheless, the chapter “Course Makeover Using User Experience Design concept” will cover some aspects that aim at providing a better learning experience.

In the last chapter, there will be some considerations that could further improve the course makeover and could be taken into account for an eventual continuation of the project.

## CONCEPTUAL BACKGROUND

### What is User Experience Design?

“User Experience, often abbreviated UX, is the quality of experience a person has when interacting with a specific design”. It has become more popular in the last few years associated with web design and mobile apps, but its first use goes back to the late 1970s with “User Experience with the Cyber Graphics Terminal” by Edwards and Kasijis, “largely restricted to the human-computer interaction communities and particularly in the context of user-centered design (UCD)” (Knemeyer & Svoboda, 2020, para.1, 3).

User Experience Design is also referred to as Usability by some authors. A good example is “a book about designing anything that people need to interact with” entitled Don’t Make Me Think by Steve Krug (2014, p.xi), which had its first version published back in 2000 and it is still now, one of User Experience’s industry best-sellers and covers the basics of good web usability.

The expression Usability is still widely used these days, particularly when referring to the use of physical products such as home appliances and it may be considered part of the broader user experience (Soegaard, 2020). In a very raw definition, Usability, as part of the user experience, which should be complemented with Utility (Nielsen, 2020), should be considered when designing anything that can be used, whether is a mobile app (Krug, 2014), a door or even a frying pan. When Usability considerations work, they can provide the user with a better experience, and the process of shaping that user experience is called User Experience Design.

Even though there is no official founder of the User Experience Design concept, the term User Experience was popularized by Donald Norman, in part due to his famous book “The Design of Everyday Things”, another User Experience best-seller, where he “explores

the idea of human-centered design, citing examples of both poor and well-designed products” (Green, 2018, para. 6).

User Experience Design may be seen as the art that starts with the process of designing a product, or even with the idea of that product, and consists of making sure that the same product will be usable in the most effective, efficient, and satisfactory way possible (Interaction Design Foundation, 2020).

There are other terms that, in a broad way, have a similar meaning or may have a strong link to the concept of User Experience Design: User-Centred Design, User Interface Design, Interaction Design, Human-Computer Interaction to name but a few. They may not mean the same as User Experience Design, but they are, in one way or another, part of the User Experience Design process. For example, the user interface is an important piece to consider when designing the best user experience in the context of Human-Computer Interaction. The look and feel of the interface can surely affect the user experience whether it is a physical product, like informative touchscreens in a shopping mall, or a digital one, such as mobile apps.

Jakob Nielsen (2020, para. 1) so-called one of the founding fathers of User Experience and business partner with Donald Norman, has recently stated that “the user experience field is plagued by vocabulary inflation: repeatedly replacing well-known terminology with new fancy words”.

When looking for information on User Experience Design it is noticeable a certain incoherence in the way different people and different organisations structure and interprets it. The discipline does not seem to lie on any convention or design model. For example, when comparing User Experience Design with Instructional Systems Design, the latest is very straightforward, the first not so much. The frameworks in Instructional Systems Design are well defined and are well known by everyone in the industry of Instructional Design. However, the User Experience Design still allows adding an extra flavour or a personal

touch to its process because there is a lack of well-established guidelines or conventions defining a set of rules that must be followed. Still, it seems to be of common understanding that User Experience Design is ultimately about designing the best user experience. In other words, “the experience the product creates for the people who use it in the real world” (Garrett, 2011, p.6).

### **How Can User Experience Design Help Instructional Design?**

“The formal practice of Instructional Design began with the need to better train soldiers after World War II.” (Pulichino, 2019, para. 1) and it has evolved a long way since. Eight decades later, various Instructional Systems Design have proven to be effective. Some of these systems are more popular than others and Instructional Designers tend to choose their favourites, but all Instructional Systems Design can influence the way instruction is planned, designed, executed, and evaluated and help to achieve the ultimate goal of providing the learners with the best experience by ensuring the acquisition of knowledge through a painless process. Unfortunately, this is not always true as the learning experience is not always the best and it is, in many cases, the Instructional Designer to blame.

Nowadays, several courses are developed following the most well-known Instructional Systems Design. Still, when attending different e-learning courses, it can be verified that some can be boring, little engaging, difficult to understand, lack interaction and, eventually, impose accessibility barriers, such as the need to install plugins or run the course in a particular browser. User Experience Design principles may help Instructional Designers overcome these issues by applying its concepts and following a number of common rules that have been used by web and mobile app designers.

The good thing is that the similarities between Instructional Systems Design and User Experience Design processes are significant. This might be an advantage to Instructional Designers trying to improve the learning experience. Despite not being possible

to find a consistent process flow for User Experience Design as it can be found in the ADDIE model for example (that follows the same five phases regardless of who is designing) most User Experience Design models may comprise similar steps, even if using different terminology, division and order. As an example, on Jesse James Garrett's model (2000) the user needs, objectives, requirements, specifications are part of the Elements of the User Experience listed in the book he wrote with the same name expressing "his disappointments and frustrations with designing complex websites without having any concrete method or model to follow" (Singh, 2018, p.8). Not binding these steps to any of the existing instructional models, in particular, we may still easily identify some familiar terms which are part of the most popular Instructional Design processes, whether these are classic such as the ADDIE model, Bloom's Taxonomy, or the more recent and agile Successive Approximation Model (SAM).

### **The Concepts of User Experience Transported to E-learning Courses**

The User Experience Design applied to Instructional Design should improve the learning experience by making it easier for one to learner online.

The way students learn can have a direct relation with their motivation and willingness to attend e-learning courses and return to complete them - the user experience has a whole lot of influence on whether those visitors come back (Garrett, 2011) - keep their attention levels, engagement and knowledge retention.

In order to do that, Instructional Designers should look at the elements, in a very similar way to those typically concerning web and graphic design, such as course accessibility, the responsiveness of the content to different devices (desktop/laptop, tablet, smartphone), adequate font type and size, text readability (use of heading, bold, underline, etc.), high elements of contrast and the use of web conventions as e-learning courses are, nowadays, more likely to be attended online.

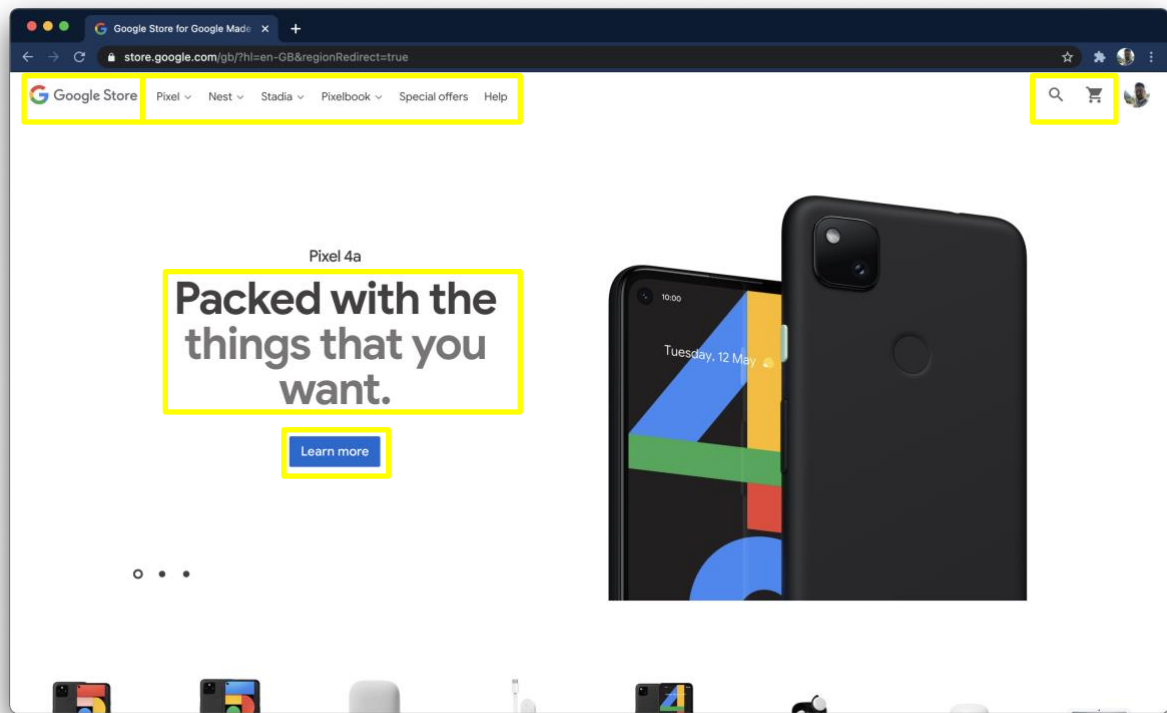
In his book about web usability, Steve Krug (2014) stated the few things that indeed should be considered to help with the User Experience: take advantage of conventions, create effective visual hierarchies, break the pages up into clearly defined areas, make it obvious what is clickable, eliminate distractions, format content to support scanning. Below, these points are listed and explained in more detail as most of them convey the use of web conventions.

### **Taking Advantage of Web Conventions**

Web conventions are design norms that “make life easier for users because they don’t have to constantly Figure out what things are and how they’re supposed to work as they go from site to site” (Krug, 2014, p.31). They can help create a cognitive schema so that users “know where to expect to find certain kinds of information or functionality” and understand what they need to do every time they enter a webpage for the first time, reducing cognitive load and improving browsing efficiency (Conversion Uplift, 2020, para. 2).

## Figure 1

Screen capture of the landing page of the Google Store website.



In other words, web conventions support users by helping them know where to expect identical objects to be placed and how they should look like. A good example is the Google Store in Figure 1, where some of the web conventions described below can be observed.

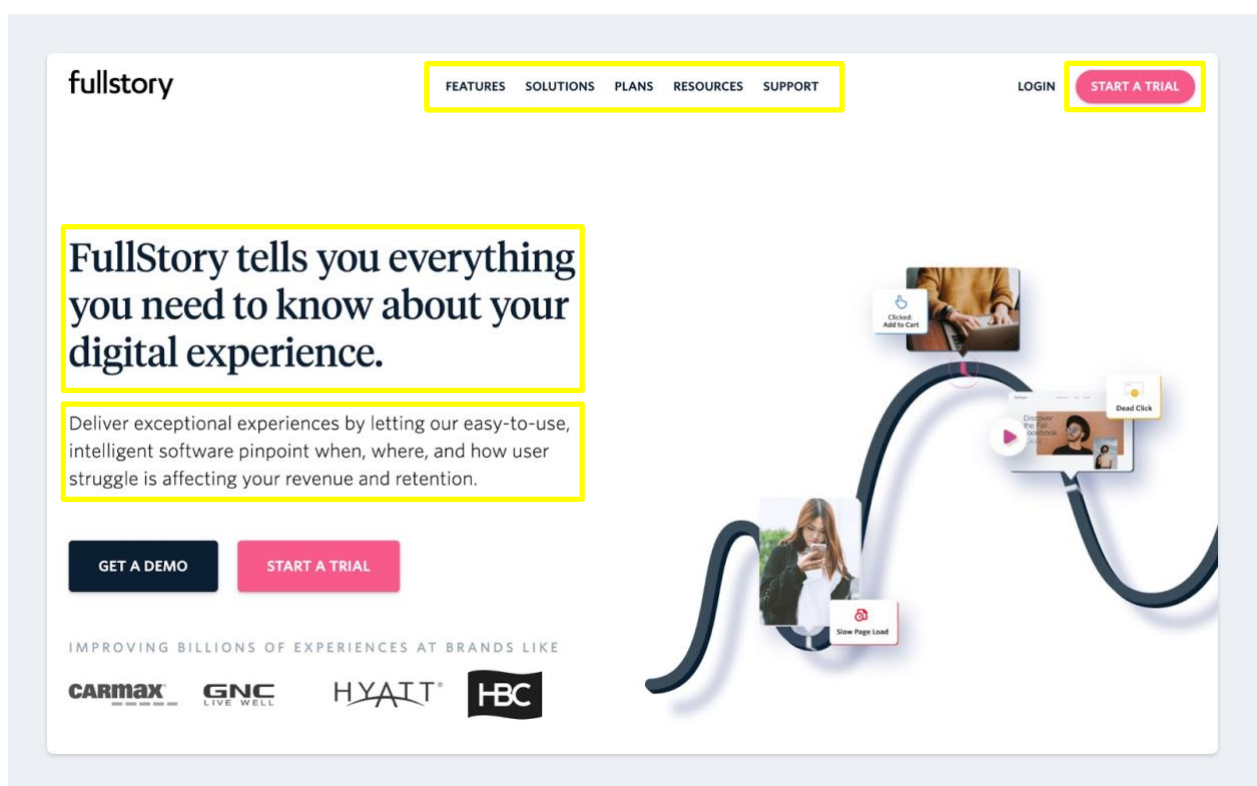
One may wonder if it does not end up being boring having everyone following the same standards imposed by web conventions. “Astonishment and surprise are not necessarily unpleasant experiences. But in a product user interface, surprise is a sign of a potential problem” (Zuschlag, 2010, para. 23).

Web conventions can and should be applied to e-learning courses bearing in mind that they will be attended online and, even if will be available offline, the users should be familiar with website navigation already.

Visual hierarchies, text formatting, primary navigation, clickable items, placement of the logos, standard icons are some of the strong web conventions that I have taken into consideration for this project, being one of the few User Design Experience guidelines that seem to be common amongst various User Experience specialists.

## Figure 2

Screen capture of an example of visual hierarchy from Adobe website.



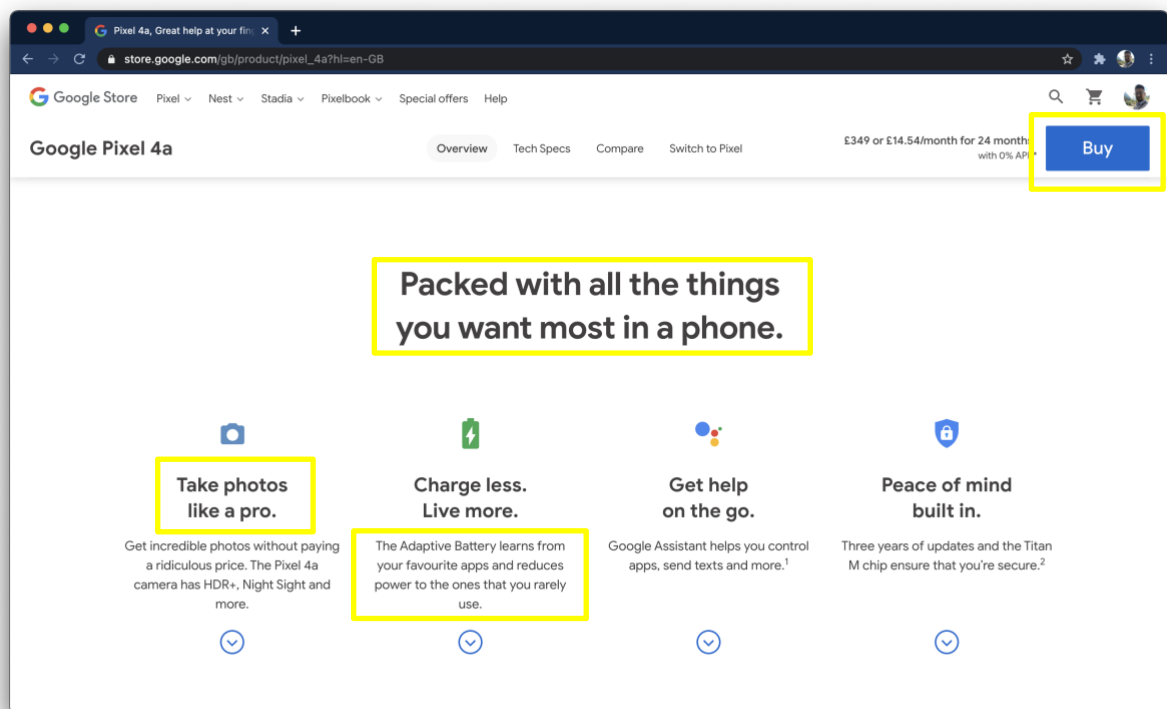
**Visual Hierarchies.** Visual hierarchies allow grouping similar items together using the same style and separate different groups by placing them on specific areas or under well-structured headings. For example, in Figure 2, it can be observed that the top navigation area is clearly separated from the page text at the bottom, which is started by the heading.



Having a neat page, such as the one shown in Figure 2, will benefit the users by providing a visual division among all elements that will help them find what they are looking for (or what the designer wants them to find).

### Figure 3

Screen capture of a product page of the Google Store website.



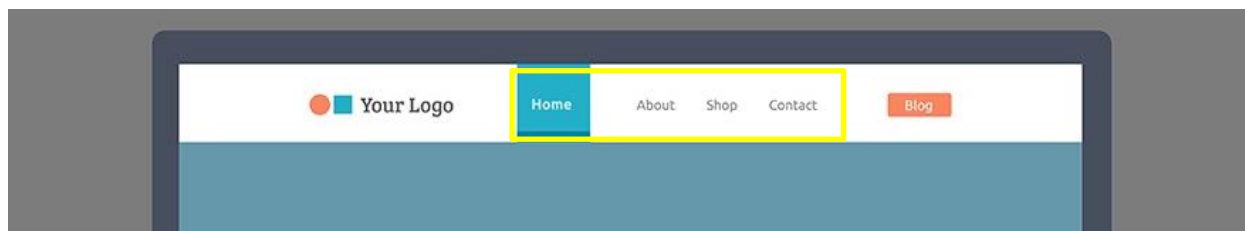
**Text Formatting.** The way the “text is formatted can do a lot to make it easier” for the user to scan it (Krug, 2014, p.39). The font size, the use of bold, italic, or underline – all help with the visual organization and can call attention to particular information. Also, the colour of the text may pass a specific message; for example, “red is strongly associated with error messages” (Conversion Uplift, 2020, para.2); text highlighted in yellow will call for the user’s attention.

Therefore, it is important to pick the more neutral colours - in most cases, the black text will be the best fit, except for dark backgrounds.

Figure 3 is a good example where the text formatting does a lot to stand out the most important information by using bigger font sizes and bold text.

#### Figure 4

Snip from the page 20+ Responsive Navigation Solutions (Examples & Codes) at medium.com



**Primary Navigation.** Generally composed of buttons or plain text that link to the most important pages or sections on the website - such as Home, About, Products - the primary navigation, should appear in a bar across the top of a website, as shown in Figure 4. For this reason, it is also commonly and simply known as the navigation bar.

The primary navigation is an element that requires careful attention as it works as a sort of a compass to take the users in the direction they wish to follow. For Krug (2014, p.63) “well-thought-out navigation is one of the best opportunities” to create a good impression to the user. It tells the user implicitly where to begin and what the options are.

**Clickable Items.** The users “scan some of the text and click on the first link that catches their interest or vaguely resembles the thing they’re looking for” (Krug, 2014, p.21) so they should clearly and instinctively understand what is clickable and what is not and, ideally, be oriented towards the direction they need to go. This can be done by using buttons for the most relevant things to click (see buttons “Start a Trial” in Figure 2 and “Buy” in Figure 3). Buttons are extremely intuitive making clear that the user should click them. For this reason, we often see them in the primary navigation bar.

Other less relevant clickable items should be formatted as classic underlined text to ensure the user perceives them as hyperlinks, meaning that words that are not links should never be underlined (The HTC Team, 2013).

**Placement of the Logos.** According to Krug (2014, p.25), “back is the most-used button in web browsers” and almost all users expect that, by clicking the site ID (usually a logo), they will be taken to the homepage. This means that the users are often trying to go back to a previous or initial stage and one way to ease their job is to place the logo or site ID, i.e., site name, where everyone expects it to be (on the upper left-hand corner of the page), make it clickable and hyperlinked to the homepage. Figures 1, 2, 3, and 4 confirm the common use of this convention.

Based on a study ran by UserZoom mentioned by Whitenton (2016, para. 4), a remote user-testing service provider, “users are 89% more likely to remember logos shown in the traditional top-left position than logos placed on the right”. This shows that people's attention and memorization process might deviate due to a simple unconventional placement of the logo.

“The logo serves as a landmark that orients users when they first land on a page and helps them identify the website they are visiting” (Whitenton, 2016, para. 1) while the homepage should serve as a reference point for the user to have a new start anytime they wish to get back to the initial stage or whenever they get lost.

## Figure 5

Examples of standard icons used on websites and mobile apps



**Standard Icons.** Website and app users will recognize a number of icons and their meaning as soon as they see them. Home, shopping cart, envelope, phone, magnifying glass, and, more recently, thumbs up, as presented in the previous Figure, are some of the icons that do not need plain text underneath to know where they lead or what they can do. Even if tempting to innovate when other sites seem to lack originality, changing the icons to less recognisable images is not a good option as it will just confuse the user and may affect its experience (Conversion Uplift, 2020).

### The Importance of Aesthetics

Additional to the User Experience concepts already mentioned, one other element that can also be considered is the aesthetic-usability effect. It “is defined as a user’s bias to perceive an attractive product as more intuitive or usable, as opposed to a less aesthetically pleasing alternative.” (Nebukhadnezzar, 2019, para. 2).

Thus, by paying attention to the aesthetic part, the User Experience might be substantially improved, even if the visual perception is subjective and may vary from person to person. Additionally, recalling the importance of eliminating distractions stated by Krug (2014), the use of minimalist design might be advantageous.

The user may be strongly affected by the aesthetic aspect of the interface even when they try to evaluate the interface in its functional aspects, and it is suggested that the interface designers should strive not only to improve the inherent usability but also

brush up the apparent usability or the aesthetic aspect of the interface. (Kurosu & Kashimura, 1995, para. 4).

### **The Importance of Content Responsiveness**

Finally, a very last concept is the content ability to respond to the window size. With so many users accessing content from different devices – desktops, tablets, smartphones – it is important to ensure that content will be fully displayed across them all.

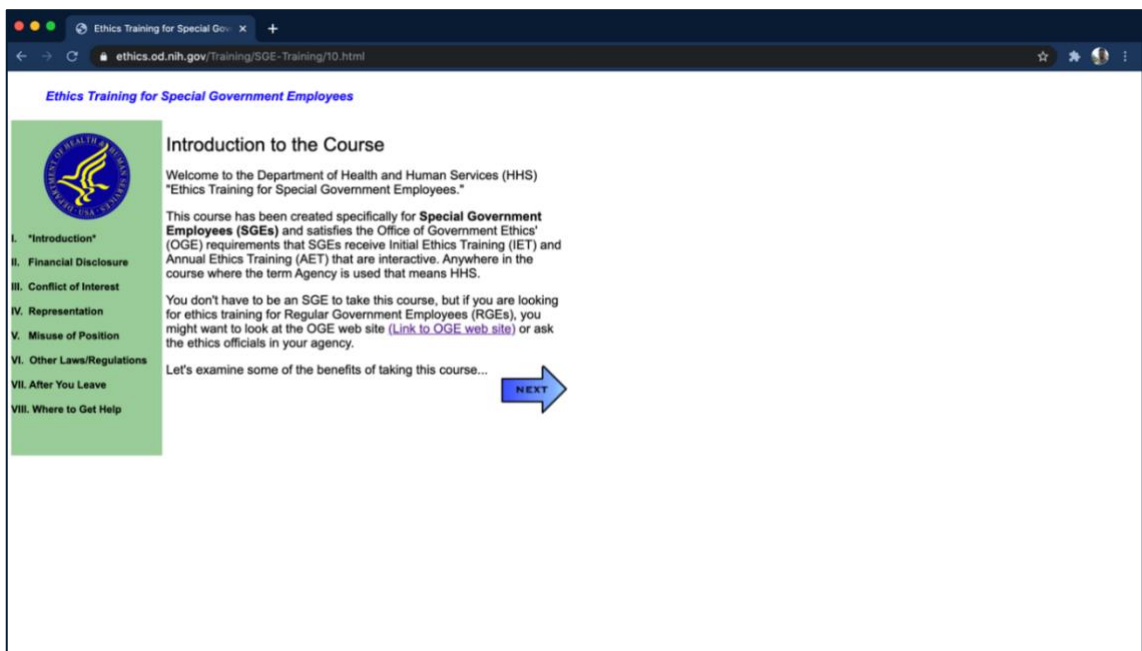
Responsive Web Design ensures that the content will display correctly for all users, providing a stronger User Experience (Phillips, 2018) and it makes all sense, especially, when visiting webpages that are outdated and were not built with mobile access in mind. Some of the most common issues found in the non-responsive website are overlapping elements, cut images, and text.

## APPLICATION OF USER EXPERIENCE DESIGN TO AN E-LEARNING COURSE

To better understand how User Experience design can be applied to the development of e-learning courses, I have decided to use an existing course instead of starting one from scratch. For this particular case, I have chosen a training course from the Department of Health and Human Services (HHS) of the United States of America publicly available at <https://ethics.od.nih.gov/Training/SGE-Training/10.html>.

### Figure 6

Screen capture of the initial course page



This is an ethics training course address to Special Government Employees of the Department of Health and Human Services (HHS) of the United States of America. It is composed of eight chapters across 78 pages and includes six quizzes.

This was identified as a good example of a course lacking some aspects of User Experience design as will be explained in the following section.

The course came to my attention in one of the E-Learning Challenges presented in an online community composed by e-learning designers using Articulate<sup>1</sup>, an authoring software. Around it, a community composed of e-learning designers, designated as 'E-Learning Heroes', that uses the software to share and present quick solutions to challenges launched every week by their director of customer training. The challenge for a particular week (available at <https://community.articulate.com/articles/give-this-ethics-training-course-a-makeover>) was to do a makeover of an Ethics Training course. This project seemed to be the right fit to develop that makeover even further, renew the whole course and compare the two versions from a User Experience perspective.

The full course makeover is available at <https://ricardoleite.s3.eu-west-3.amazonaws.com/ELHChallenge/%23281/story.html>

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<sup>1</sup> Articulate offers a range of different tools to help build e-learning content. I have used one of their most popular software, Articulate Storyline to develop the course makeover. Because it is a paid software, I have used the 60-days trial version to do this work.

**Figure 7**

Screen capture of the opening page of the course makeover



The process of going from the initial version of the course to the makeover showed above will be described in the following pages.



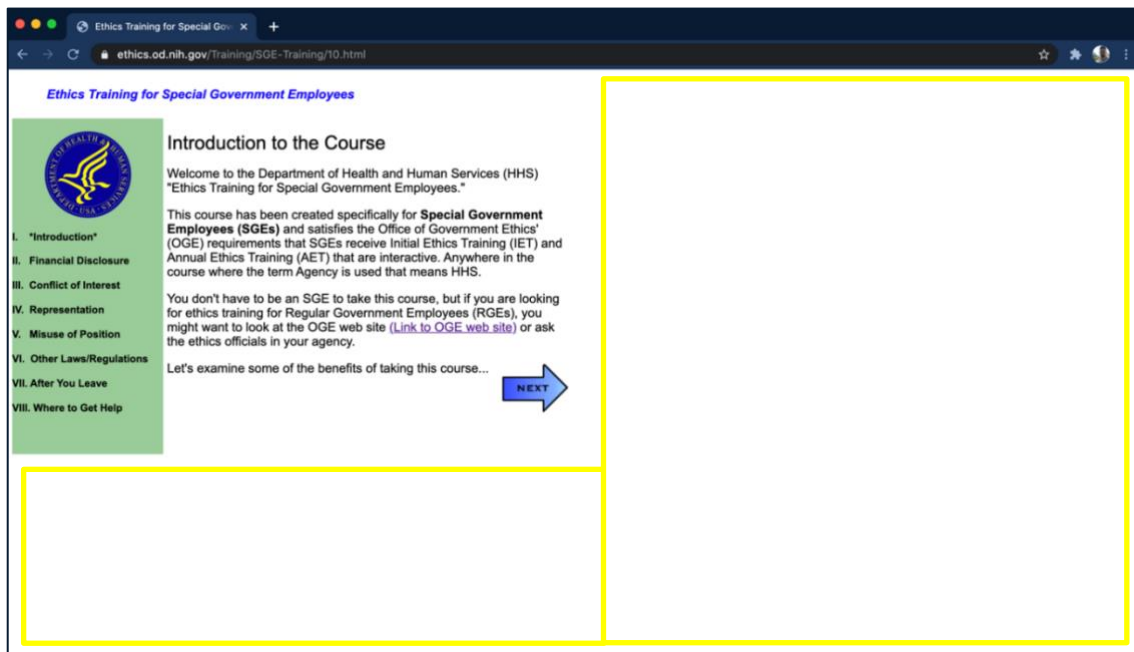
## Assessment of the User Experience of an existing e-learning course

### Blank space

Entering the course, the first thing that stands out is the large blank space on the right-hand side as well as at the bottom of the page. As it can be seen marked yellow in Figure 8, the content is displayed in less than 50% of the available space. This does not support the concept of breaking the page into clearly define areas due to having all the content condensed on one of the sides. The learner would have benefited from the better use of the extra blank spaces to have clearer visual hierarchies adding more space between headers and paragraphs, and enhanced text formatting using bigger font sizes.

### Figure 8

Screen capture of the initial course page highlighting the blank space



## **Lack of visual elements**

Another particularity that can be observed in Figure 8 is the reduced number of visual elements. Apart from the HHS logo and navigation arrow, everything else on the initial page is plain text. While the text is crucial, the message can benefit from the support of visual multimedia elements such as images or icons and they will also help the learners with scanning the content.

The following pages of the course are slightly more visual with the use of a clipart image on the top hand-right corner, but the relation between the image and the content could be significantly improved.

Additionally, the course would have benefited from the use of icons. For example, having icons next to the text in the table of contents could help the learners having a visual and prompter assumption of the subject just by looking at it.

## **Navigation**

The importance of primary navigation has already been covered. If the primary navigation does not work well, the learner will likely struggle to navigate across the whole course, leading him/her to frustration and potential loss of interest as well as motivation to proceed.

In this example, the primary navigation is inexistent and, therefore, it is one of the greatest weaknesses of the course. The table of contents that can be observed on the left-hand of Figure 9 is in a read-only format; it does not allow the learner to jump to a specific topic if they wish to. The primary navigation was likely left aside due to the intention to force sequential access to the content and enablement of the next module only after completing the previous. However, there are means of making content sequentially available while still imposing navigation through a menu. The learners benefit from the open navigation feature even if they have to access some modules before accessing others, as they might need to

quickly consult the topics that they have already completed (e.g., accessing module no.2 while on module no.5 without the need to use the back arrows and revisit every page in between).

**Figure 9**

Screen capture of the second page of the course

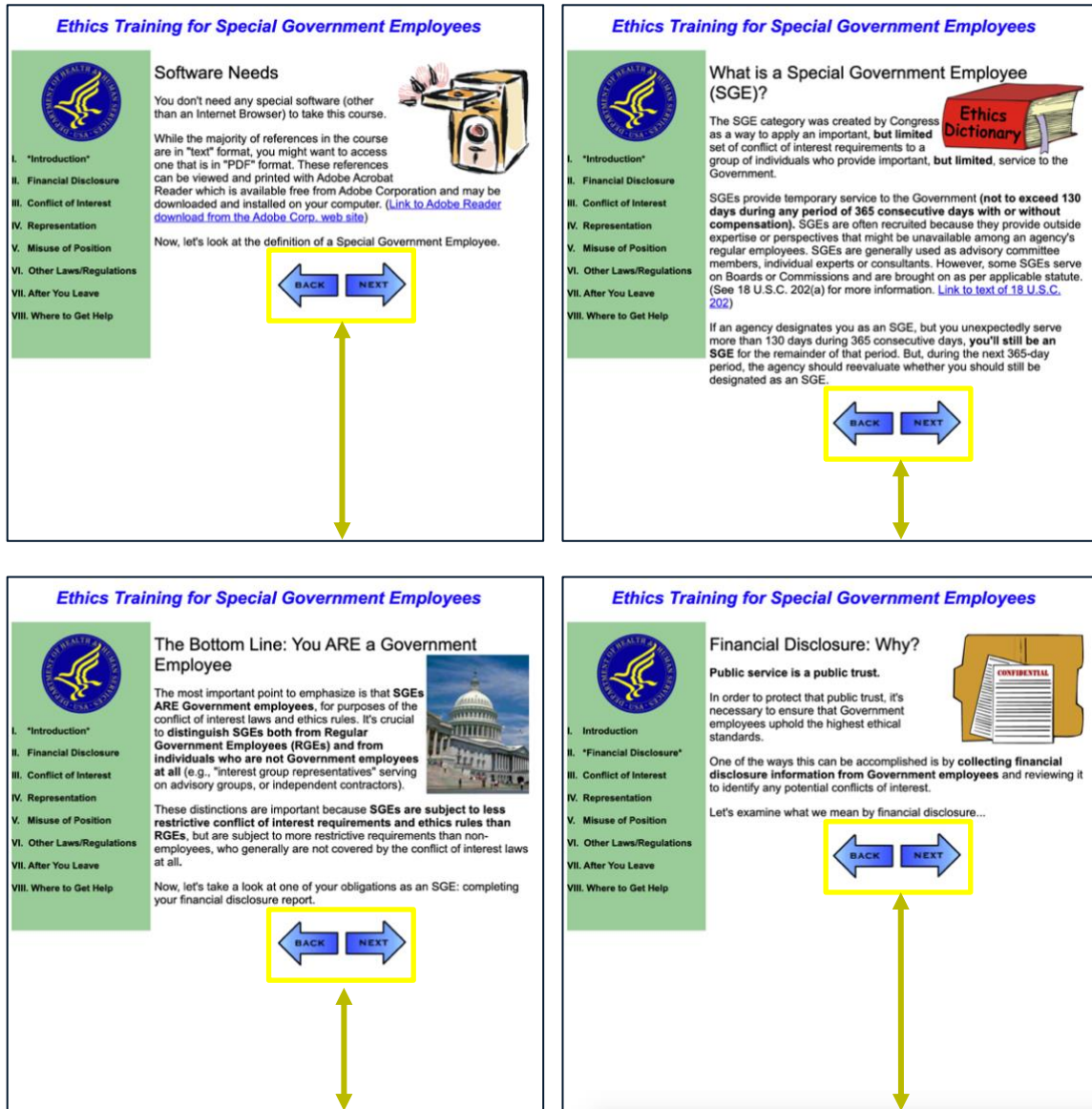


### Clickable items

I already referred to the inexistence of a navigation bar or menu, which is one of the most important clickable items when thinking of website navigation and User Experience but there are others as important – navigation arrows (next, back) home button, links. One that jumps to sight in this example is the navigation arrows. If on one hand, they are visible enough and seem to be well-positioned on the initial page of the course (Figure 8), by moving forward in the course the user will be forced to move the mouse cursor up and down before clicking of 'next' or 'back' as the buttons move depending on the number of characters and lines in the page body.

Figure 10

Screen capture of different pages showing different positioning of the navigation arrows



In Figure 10 it can be observed the change of position of the navigation buttons across different pages. The displacement of the buttons causes the impression that the elements are not aligned and out of place. This will negatively affect the learning experience, even if, in this particular case, the clickable items can be easily identified, which is a common concern when designing websites or mobile apps.

All other clickable items use the classic formatting for hyperlinks. A simple but effective choice.

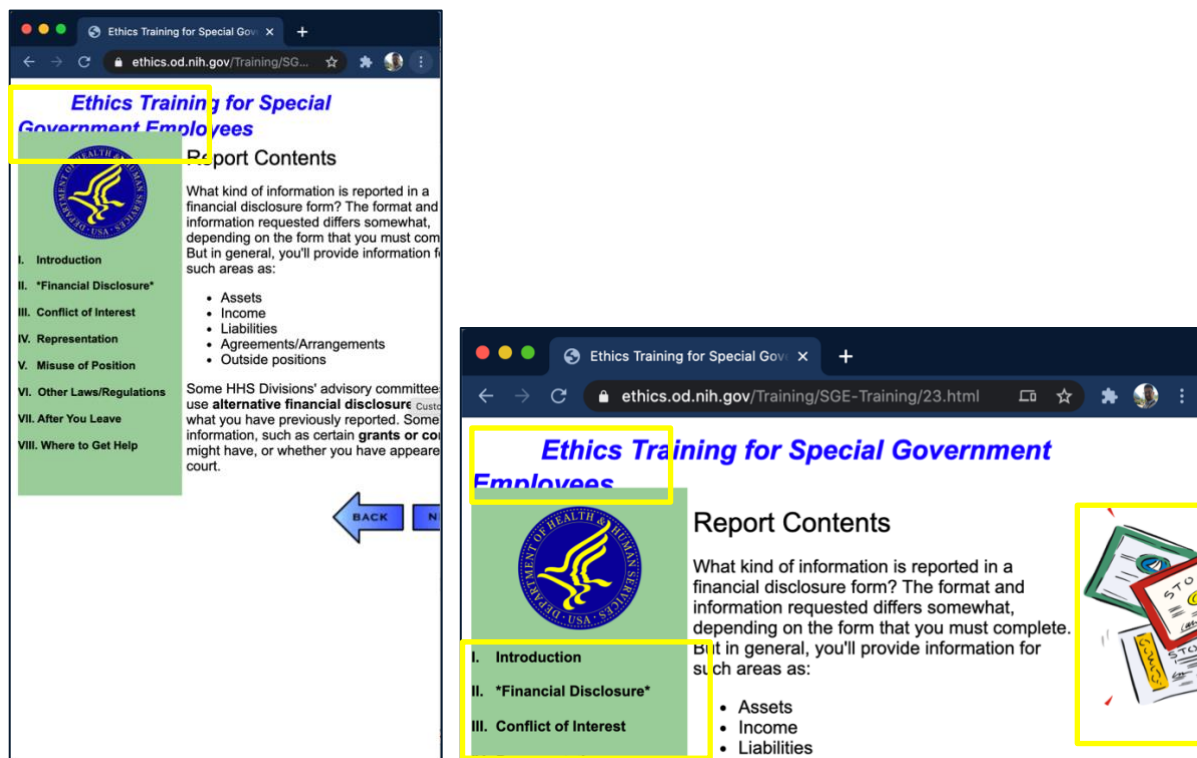
## Placement of the logo

The position of the logo aligned to the left of the page (see Figure 9) is totally in accordance with the web conventions. On the contrary, clicking the logo does not take the user to the initial page as it would be expected on webpages. Instead, it opens up the image in a new tab.

The course designer should have used the logo to bring the learner back to the initial page or, alternatively, provide the contact details of the HHS.

**Figure 11**

Screen captures of the course on a resized browser window



## **Responsiveness to different screens**

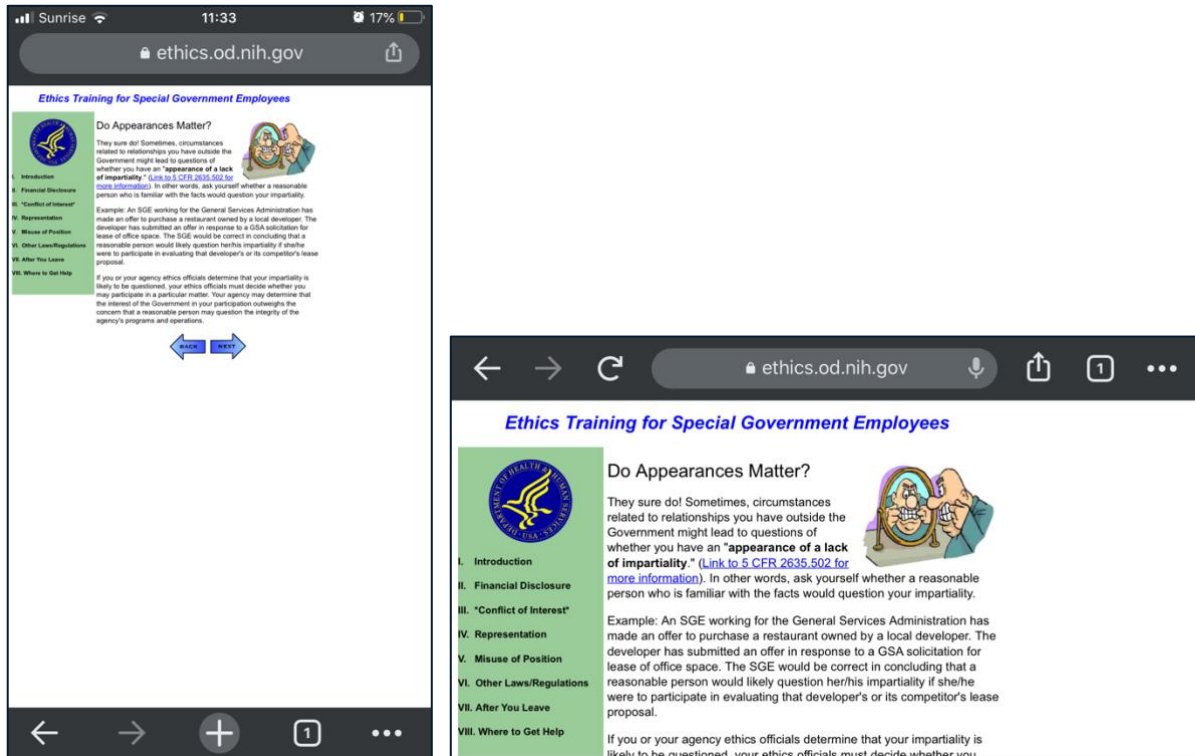
The course does not provide information on when it was released, but considering its look, it does not seem to be recent. On the other hand, all links seem to be working, which may be an indication that it is still being used at the time of this assessment.

For a course with such a relevant theme and that is still being used today by a renowned organisation, the content should be responsive and adapt to different screen sizes. However, when trying to adjust the size of the browser windows, the content did not adapt to the screen. Instead, it cuts parts of the page as can be observed in Figure 11.

Trying to access the course from a mobile device (for example, an iPhone 8) the content fitted in the screen with resolution 750x1334 pixels (Figure 12). This might be the reason why the content is not showing the full width and height of the page when accessing from a desktop browser as it seems to be a workaround for the lack of responsiveness.

**Figure 12**

Screen captures of the original course on a mobile device (portrait and landscape orientation)



## Aesthetics

As previously mentioned, the course aesthetics also play a role in the User Experience. Having assessed this course at a period where the look and feel of digital content matters and the access to free, modern, and pleasant elements, the course gives the impression that it has been developed in the 1990s having into consideration the illustrations being used, looking olden and unattractive.

## Course Makeover Using User Experience Design concept

## Blank space

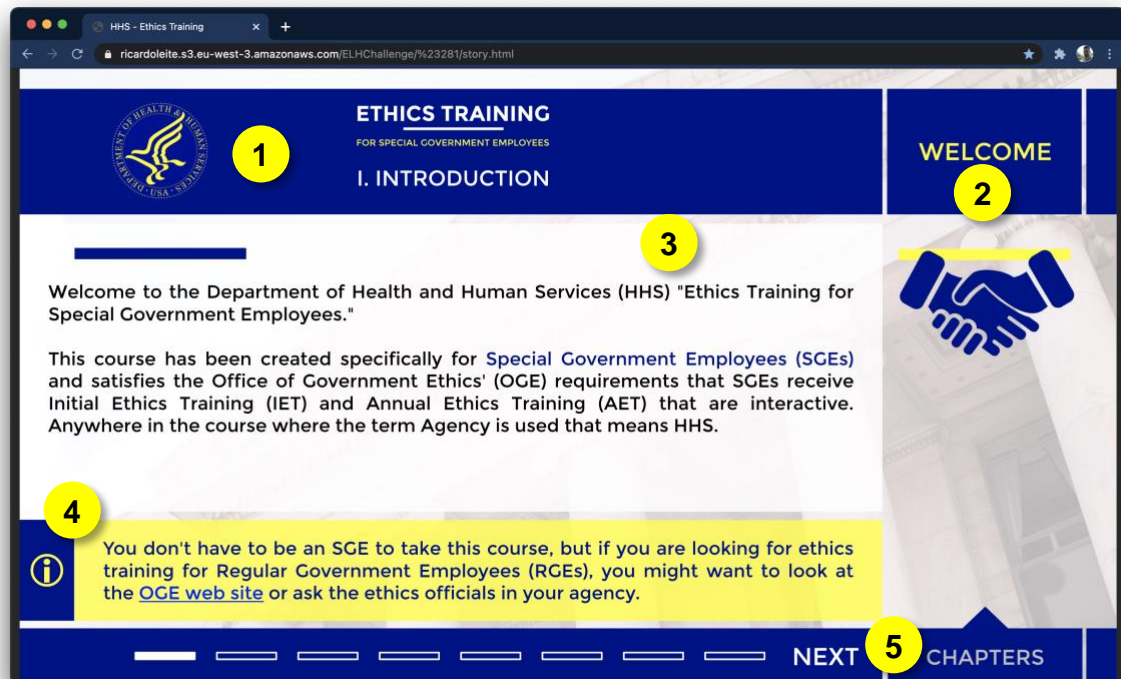
In the renewed version of the course, I wanted to use the screen space as efficiently as possible to reduce the volume of blank spaces in the original course. This change, also aimed at breaking the page into clearly define areas as observed in Figure 13:

1. Course Title and Chapter
2. Page title and icon
3. Text body
4. Notes
5. Navigation area

## Navigation

Figure 13

Screen capture of the welcome page of the course makeover





The learner may benefit from the improved screen space, the clearer visual hierarchies, and the enhanced text formatting of headers and paragraphs by using different colours to highlight the most relevant information.

### **Lack of visual elements**

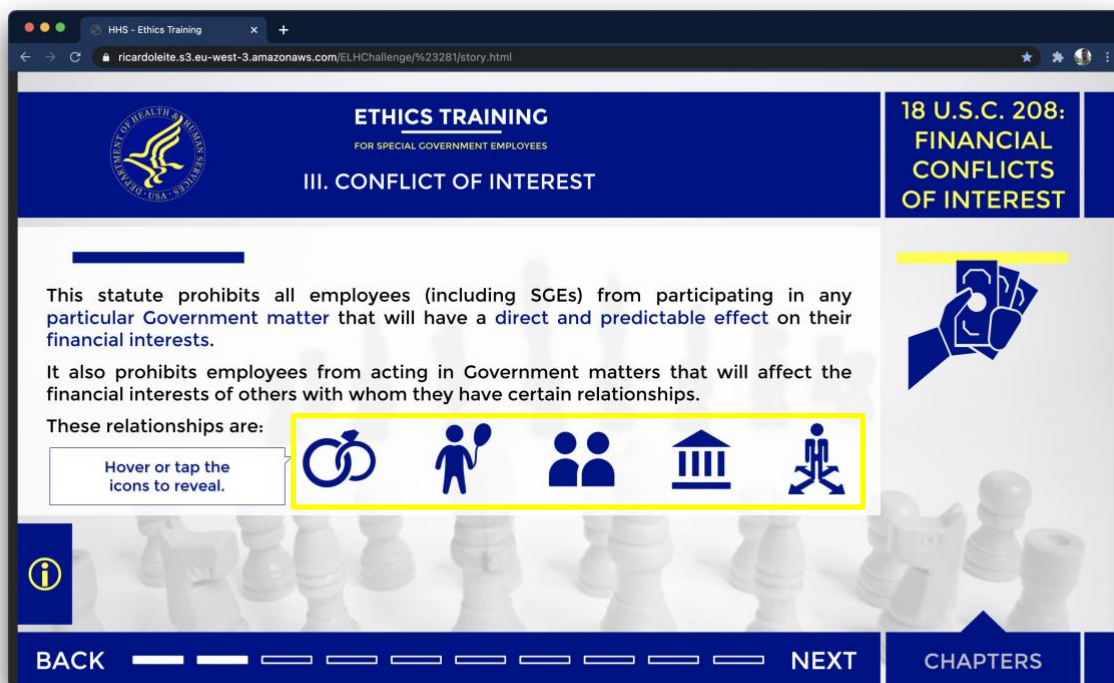
I have tried to solve the lack of visual elements observed in Figure 8 by including an image in the background that relates to the topic. Even if most of the image is covered by the header, body text, and notes, it can be seen by the learner as soon as they start a new page before the animated boxes get into place.

In the original course, the visual elements used were clipart images and, often, the image used did not seem to fit in the context. Here, I have opted for using very clean monochrome blue icons, so that these visual elements do not make the page look too busy.

Alternatively, a part of the text could have been reduced by using various visual elements, but the aim of this project was not to change the content, so I have kept all original text and tried to create better relations between the content and the icons. For example, in Figure 14, I have replaced the original bullet points with icons that reveal that same information when tapped (on a mobile device) or mouse hovered (on a computer). The use of these icons should support a better User Experience, not only for making it more visual but also for adding clickable items that require the learner intervention, resulting in greater human-computer interaction.

**Figure 14**

Screen capture of a page in the course makeover with different visual elements



## Navigation

One of the biggest problems identified in the original course was the inexistence of primary navigation. The solution was to add a navigation menu, as seen in Figure 15, that can be accessed at any time by clicking on the button CHAPTERS. From this menu, the learner can jump from one chapter to another without much effort, which comes in handy if they wish to review a previous chapter or just take a look at a chapter further in the course.

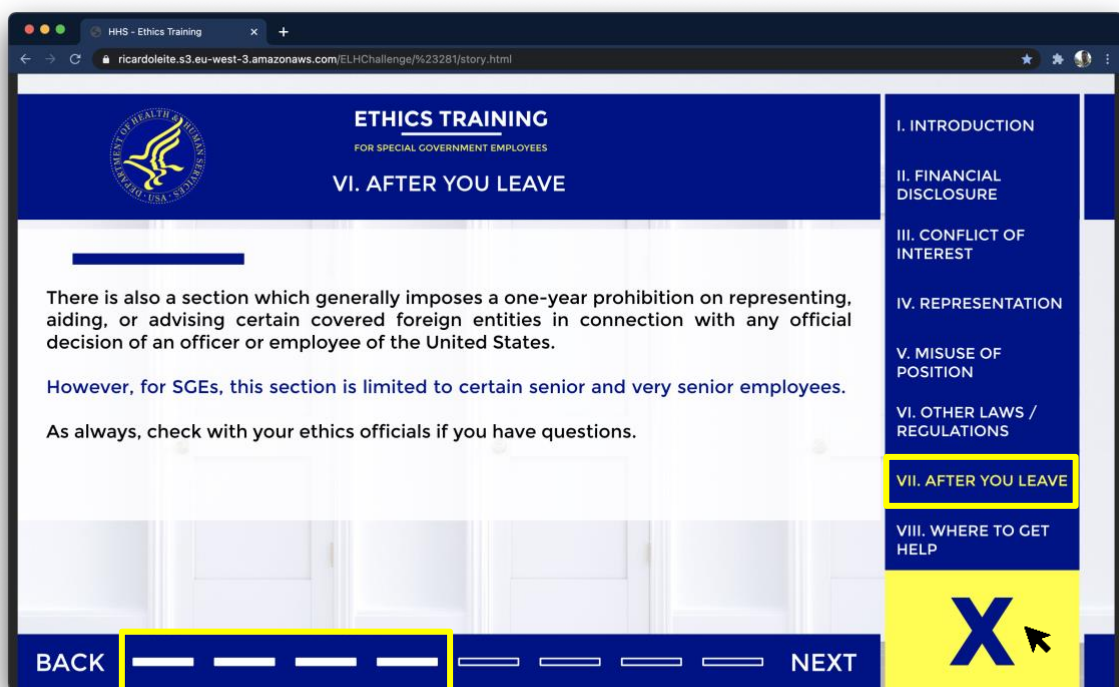
The compliance factor in the open navigation can be questioned, knowing that the learners can jump straight to the last chapter and get the certificate of completing without going through the whole course. However, the original course does not impose any restrictions apart from requiring the learner to click the next button and replying to the assessments without consequences if they answer incorrectly. It might be worth mentioning that the tool used to develop the course makeover have ways of tracking the completion of

the assessments and that, if necessary, I could have enabled a number of triggers and variables to ensure that the learner would go through every page or complete every assessment before being able to get the certificate.

Other important navigation items are the buttons BACK and NEXT, which were strategically placed next to the CHAPTERS' menu to focus all navigation items in the same area. I have added page markers in between the buttons BACK and NEXT to help learners understand their location in the course by looking at which marker they are at and the respective chapter in the navigation menu. So, by looking at Figure 15, I can easily identify that I am on the fourth page, out of eight, and on chapter seven out of eight.

**Figure 15**

Screen capture of a page displaying the navigation menu



## Clickable items

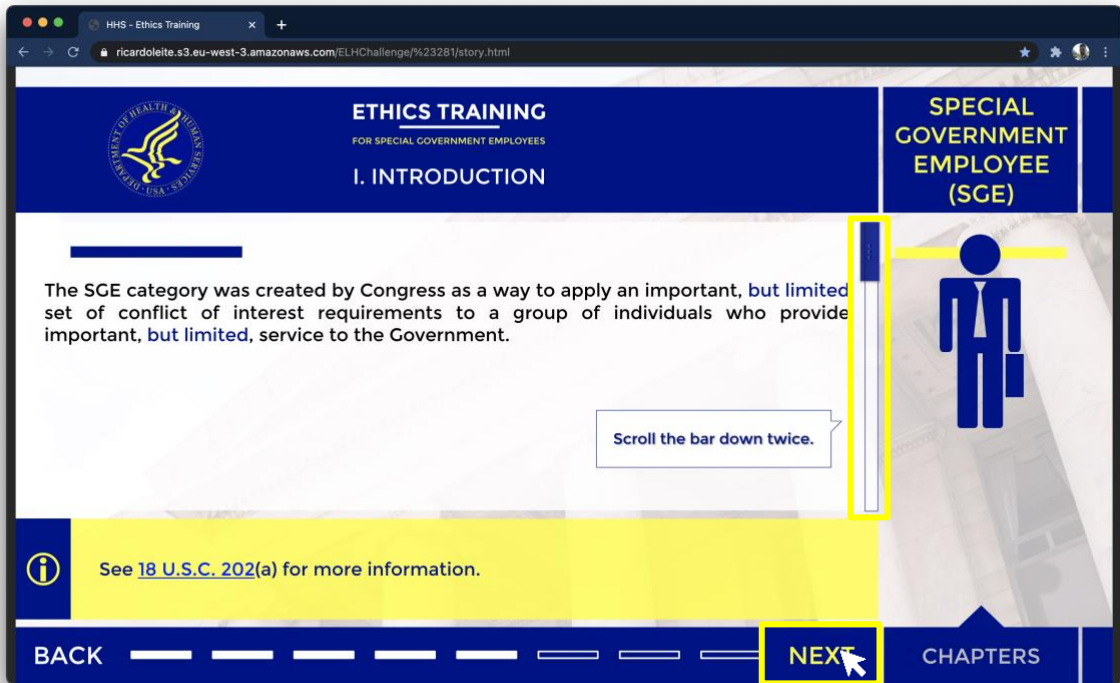
Another issue that has been pointed out in the course assessment is the navigation arrows' placement depending on the number of characters and lines on each page. This design choice makes the arrows difficult to click on. As a solution, the buttons were placed in a fixed position at the bottom of the page, so that the learner does not need to be looking for the BACK and NEXT buttons.

In Figure 16, we can observe that the button NEXT changes from white to yellow on mouseover. This will help the learner understand that it is a clickable element. The same goes with buttons on the navigation menu (see Figures 15 and 17) and hyperlinks. They all change colour on mouseover. On a mobile device, this might not be as intuitive, as there because mouseover is not possible, however, the experience is very similar to a webpage. They will realise that change of colour once they tap on them.

Scroll bars have also been added across the course (see Figure 16), in pages where the text was too long. Even if slightly different objects than buttons and links, scroll bars are also clickable and promote the user's interaction with the course elements. The main reason for adding them was to keep the same number of pages as in the original course, without compromising the font size. This aids in keeping a similar learning experience on all pages.

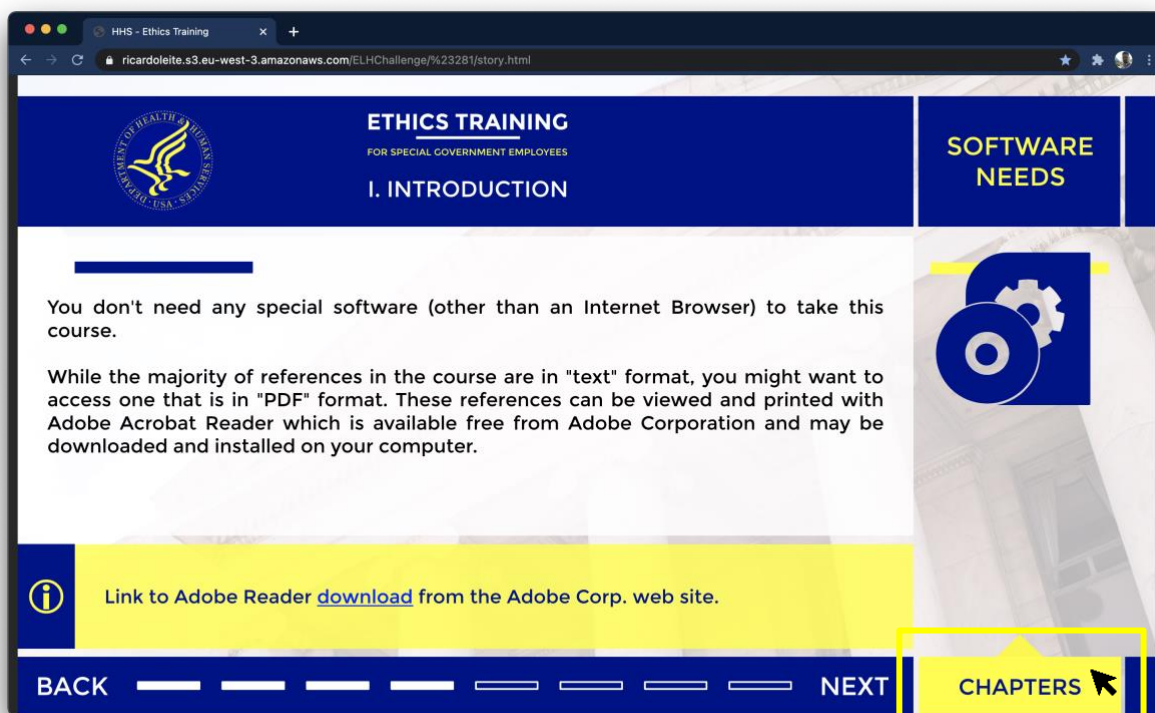
**Figure 16**

Screen capture of a page displaying the button NEXT being mouseover



**Figure 17**

Screen capture of a page displaying the button CHAPTERS being mouseover

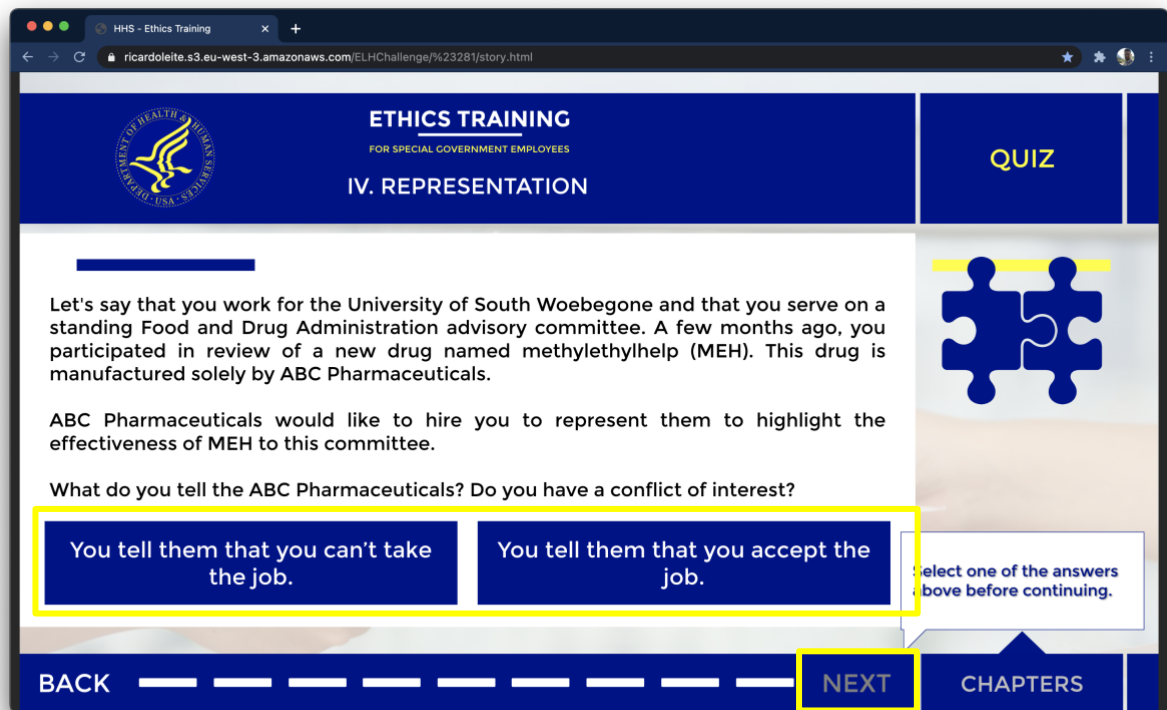


In Figure 18, we can see a page with a quiz. Most chapters, except the Introduction, have one at the end to check the knowledge learners obtained in the previous pages. In the original course, a hyperlinked text would make them answer the questions. Because this could be confused with any other link, I have used buttons to give learners bigger satisfaction of clicking a large button and make it obvious that they were replying to a question.

Note that in the particular case of the quiz, the button NEXT is disabled until the learner clicks one of the answers that will take them to the feedback page and allow them to continue from thereon.

**Figure 18**

Screen capture of a page with a quiz



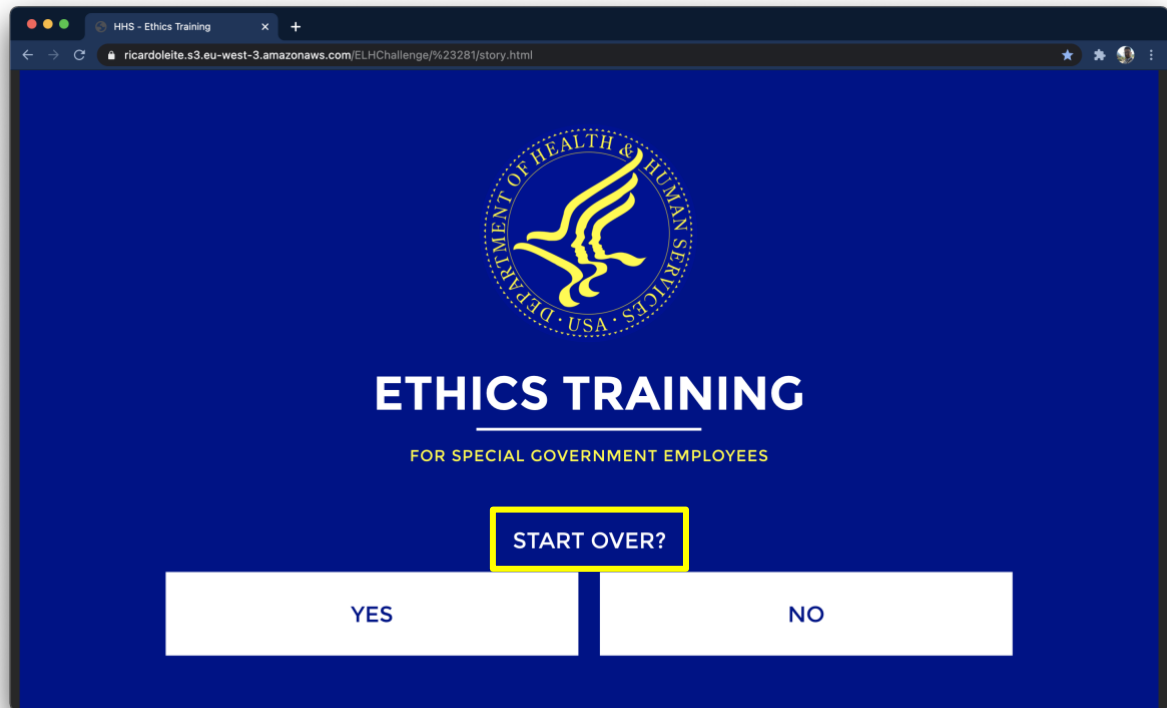
### Placement of the logo

The logo was kept on the left-hand side of the pages, similar to the original course. It is the most common placement on websites, so it is easy for learners to acknowledge it. As stated, the logo should serve as a reference point for the user to get back to the initial page.

With this being a course, not a website, I considered it important to have an intermediate screen (see Figure 19) asking the learners if they wish to start over. Clicking an element on the page is all it takes to go from a nearly finished course to the first page. Of course, this would not be a great deal because the navigation menu will allow them to get back to the last viewed in few clicks. Still, I wanted to be cautious and give the option for the learner to cancel this action before being taken to the very first page.

**Figure 19**

Screen capture of pop-message after clicking the institution logo in a course page



### **Responsiveness to different screens**

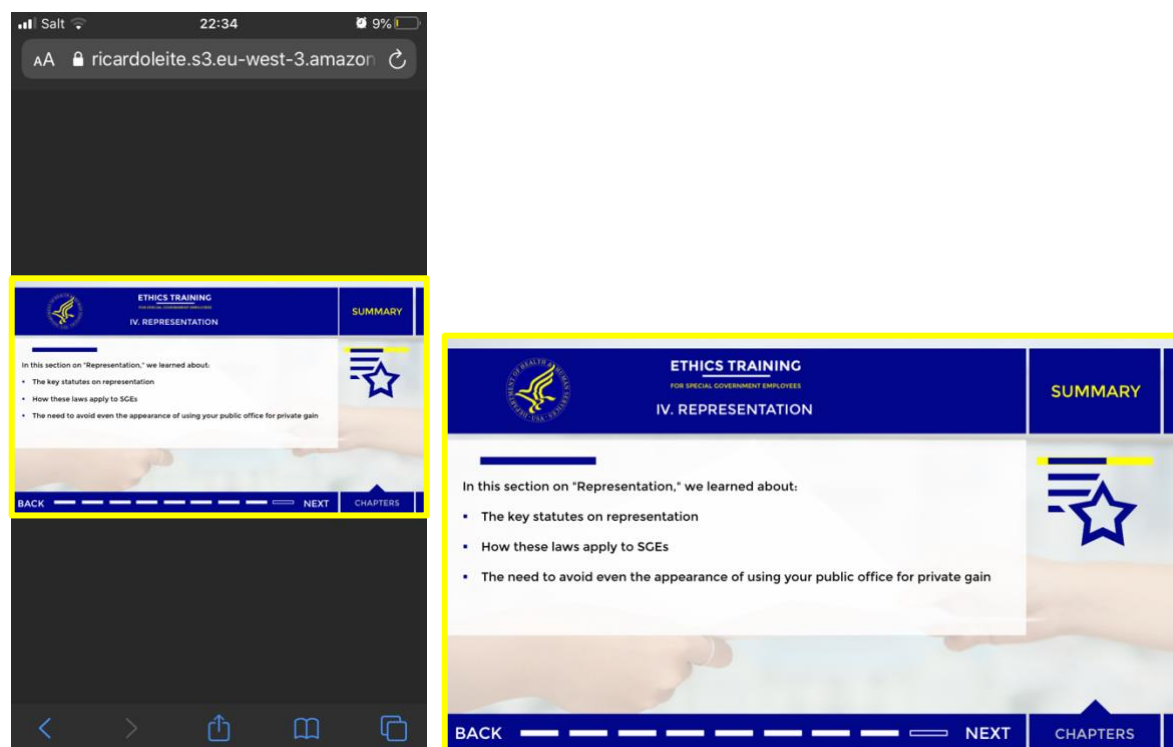
As verified in the assessment, the pages in the original version were not responsive to different windows sizes. While I was not able to build a fully responsive course that would adjust the elements to both portrait and landscape layouts, the content was built to work on mobile devices.

Accessing the course from the same mobile device as used for the original course assessment – an iPhone 8 with a screen resolution of 750x1334 pixels – while on portrait mode, I was still able to read the text clearly and tap on all the clickable elements without major difficulties (see Figure 20). This was possible due to having built the new course version with a larger font size than the original version as well as bigger buttons. Turning the smartphone horizontally, it automatically adjusts the content to fit the whole screen in landscape orientation, providing an experience similar to accessing it from a computer.



**Figure 20**

Screen captures of the new course on a mobile device (portrait and landscape orientation)



## Aesthetics

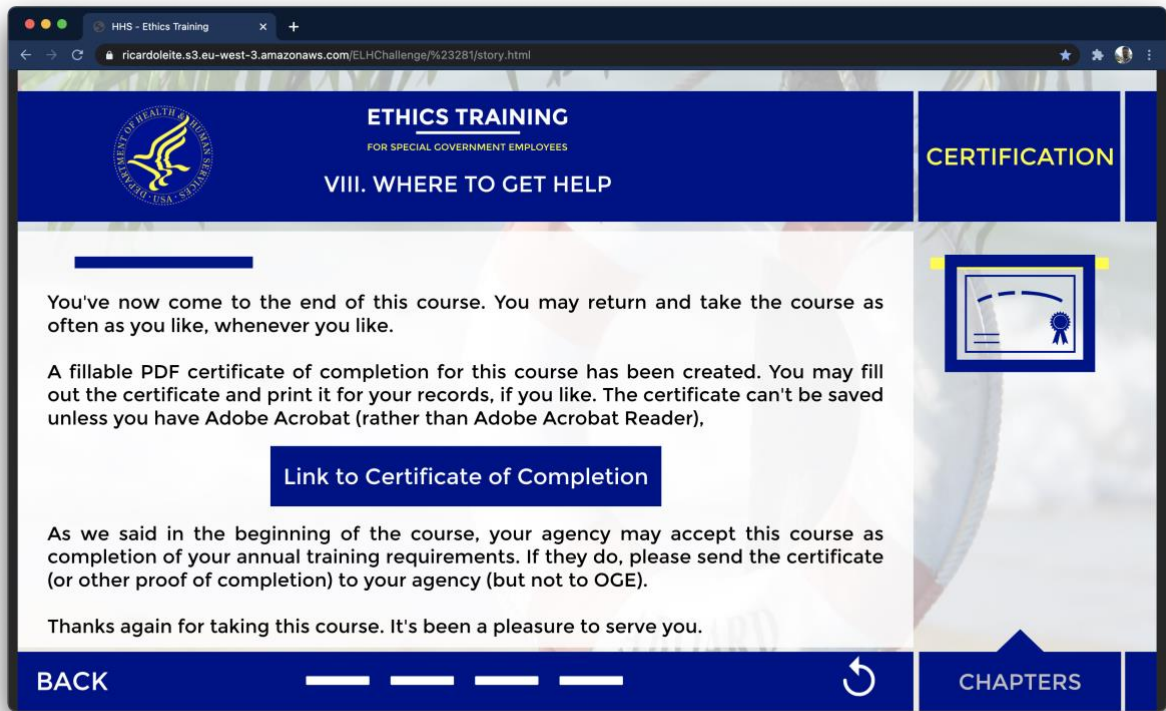
The new course makeover was built considering the aesthetic aspect of the interface as it seems to affect the User Experience positively, and despite not following a minimalist design, it certainly has a clean and neat look that supports scanning.

I have decided to use only a few colours, so most of them revolve around HHS's logo yellow and blue. It turned out that these colours combined with black and white text, offer great contrast which also helps with reading.

Looking at Figure 21 as an example and comparing it with the pages in the original course (e.g., Figure 6), it is noticeable that the makeover has a more modern look, and the elements seem to be more harmonised with each other, promoting a better experience for the learner.

**Figure 21**

Screen capture of the last page of the course makeover



## FINAL REMARKS

The project aimed to demonstrate how applying concepts of User Experience Design to the development of e-learning courses can help deliver a better learning experience. The assessment of the original course and the makeover version demonstrates that some aspects of e-learning courses can indeed be improved by bringing these guidelines from User Experience Design. Of course, the Instructional Designer does not need to be familiar with User Experience Design to improve the learners' experience, but it can certainly help in the process and, eventually, identify some blind spots not covered in Instructional Systems Design models.

When I initiated this project, I was far from understanding the difficulties of finding academic literature on the subject of User Experience Design. Knowing from the start that the term User Experience Design has been used for a number of years now, I expected to see further articles on this subject but most of what I have found was actually written in articles online or book-based. The book "Don't Make Me Think" by Steve Krug, has been revealed as my reference guide.

As stated by Leonardo Da Vinci, cited by Rodriguez (2016, para.14) "Art is never finished" and the same goes with software, websites, and e-learning courses. There is always something that can be further improved. User Experience Design concepts can support that further development by treating courses as if they were a website. The learners will benefit from that extra effort, knowing that a learner who is following a course on a computer, tablet or smartphone already had at least some experience with websites, and recognising some of the web conventions will certainly make their learning easier, by letting them focus on the content rather than spending their time figuring out things like where to click to proceed to the next page or slide, where to find the menu or table of contents to get back to a previously accessed topic or restart from the initial page.

With this, I am conscious that a lot more could be done to improve the course even more. From the User Experience Design perspective, I noticed that, as I performed the evaluation of my own course makeover and read the literature, it would have been useful to run a Usability Test. In fact, the User Experience Design process cannot be fully complete without testing the product. Steve Krug (2014, p.114) stated that “testing one user is 100 percent better than testing none.” However, running a test or survey has not been foreseen for this project, so follow his idea of “do-it-yourself usability testing” (p.115).

The effectiveness of the User Experience Design concepts applied to the course could have been confirmed by observing users going through the course and, for example, measuring their reaction times, their difficulties to perform specific actions, or the level of their reading fatigue, considering there is a lot of text to read.

Furthermore, the course could have also been improved by using other elements that would affect the learning experience but were not found in my search for User Experience Design rules, guidelines, and conventions. One of them is the use of voice-over and additional images as an alternative to text. While I wanted to keep the structure intact, there is a considerable amount of text in the course. By the time the learner finishes the courses, assuming it is completed in a single access, the learner will have read more than 5000 words. The auditory narration of the content could have enabled the use of less text and eventually replace a big part of it with illustrations to enhance learner understanding as suggested by the Multiple Representation Principle in Richard Mayer’s (1997) Cognitive Theory of Multimedia Learning.

Another point that could have been covered, and somewhat related to the User Experience, is content accessibility. While the course is prepared for screen readers for visually impaired users, many of the principles and criteria in the Web Content Accessibility Guidelines (WCAG) were not considered. One easily identifiable issue is the difficulty to navigate the course using a keyboard because the course was not built with that in mind.

Overall, the results of my work were satisfactory and in line with my expectations and I believe there is room for further investigation in this relation between User Experience Design and Instructional Design, perhaps in the form of a research paper.

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