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Improving success/completion ratio in large surveys: a proposal based on usability and engagement

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Web forms are **everywhere**

Introduction

- During the last years a lot of work has been carried out in relation to the questionnaires, establishing that users have some reluctance to complete a form from even before to begin filling it

- According to the literature (Jarrett &Gaffney, 2009), it has been proven the following regarding users' behavior towards forms

  1. Users rely more on websites (than before), even being more willing to perform complex actions (at all levels), such as purchases, payments, etc.

  2. They protect more their information, they are less willing to disclose personal information

  3. They demand better products, are less tolerant to bad forms

Introduction

- According to the literature, and intimately related to the Social Exchange Theory (Dillman, 2000) some authors (Jarrett &Gaffney, 2009) distinguish three layers in the forms: relationship, conversation and appearance

  1. The relationship of a form is based on the relationship that who asks the questions has with whom responds

  2. The conversation of a form goes from the questions that are asked, to the instructions given or to the organization of the questions according to their topic

  3. The appearance of the form is the image it displays: placement of text, graphics, areas of data entry, color, etc.

Improving these factors (relationship, conversation and appearance) makes easier for the user to participate and complete his task within the questionnaire

Introduction

- This paper presents a research aimed at designing and validating different changes in the context of a very large questionnaire regarding users' trust, user experience, usability and engagement with the final goal of improving the users' completion/success ratios

- These possible improvements are compared with another questionnaire previously developed for the same topic and context, by means of different methodologies and approaches

Background: The Spanish Observatory for University Employability and Employment (OEEU)

- During the months of June-July 2015, the Spanish Observatory for University Employability and Employment (OEEU) contacted several thousand Spanish university graduates (133588 individuals) through the universities (48, public and private institutions) where they got their degrees in the course 2009-2010 to invite them to fill out a questionnaire

- This questionnaire varied between 63-92 questions and 176-279 variables depending on the itinerary that the user follows depending on the responses. It can be stated without doubt that the questionnaire is very extensive

- The number of users who started the questionnaire was 13006 (9.74% of the total population), of which 9617 completed it (7.20% of the total population, 73.94% of the total started questionnaires)

Background: The Spanish Observatory for University Employability and Employment (OEEU)

- Now, in 2017, a process of gathering information similar to the one carried out during 2015 will conducted again. In this case, the information to be collected is about graduates of masters studies that ended their studies during the 2013-2014 academic year

- For this purpose, a questionnaire composed of between 32 and 60 questions and between 86 and 181 variables to be measured has been proposed (the questionnaire has again several itineraries depending on the user's answers)

- Despite the differences, it is a large questionnaire and shares some of the problems of the previous one in terms of difficulties or challenges that can appear during its completion by the users

Research goals

- Study how to improve the ratio participants actually starting the questionnaire (previously, close to 9.7% of the total population)

  - This will be done by improving the invitation process to graduates

- Study how to improve the completion rate of the questionnaire (previously 73.94% completion rate)

  - Studying the improvements that can be implemented in questionnaires to improve participation and completion ratios

Proposed improvements

TR1. Modify the text and appearance from the invitation letter to the questionnaire

- Inclusion of the university logo that sends the invitation, the inclusion of the OEEU logo, a change in design to make the questionnaire according to the colors and fonts used in other OEEU's products, and changes in the text to be perceived as a more personal invitation to the graduate. These changes are intended to improve user trust in the questionnaire and the activity of the Observatory

Proposed improvements

TR2. Adequacy of the image to the other digital products of the Observatory

- Through modifying colors, logotypes, typography, etc. to correspond the other products of the Observatory like its website http://datos.oeeu.org. This change is supported by the literature as a way to enhance the users' trust in the Observatory brand and products

Proposed improvements

TR3. Inclusion of the Observatory's logo and university's logo

- In the same way that previous proposal, the inclusion of the OEEU logo and the university logotype can reduce the distrust of the graduate to participate. In this case, the logotype of the university will help to build trust on the questionnaire website and the OEEU logotype will help him/her to associate the product with the institution that proposes it

Proposed improvements

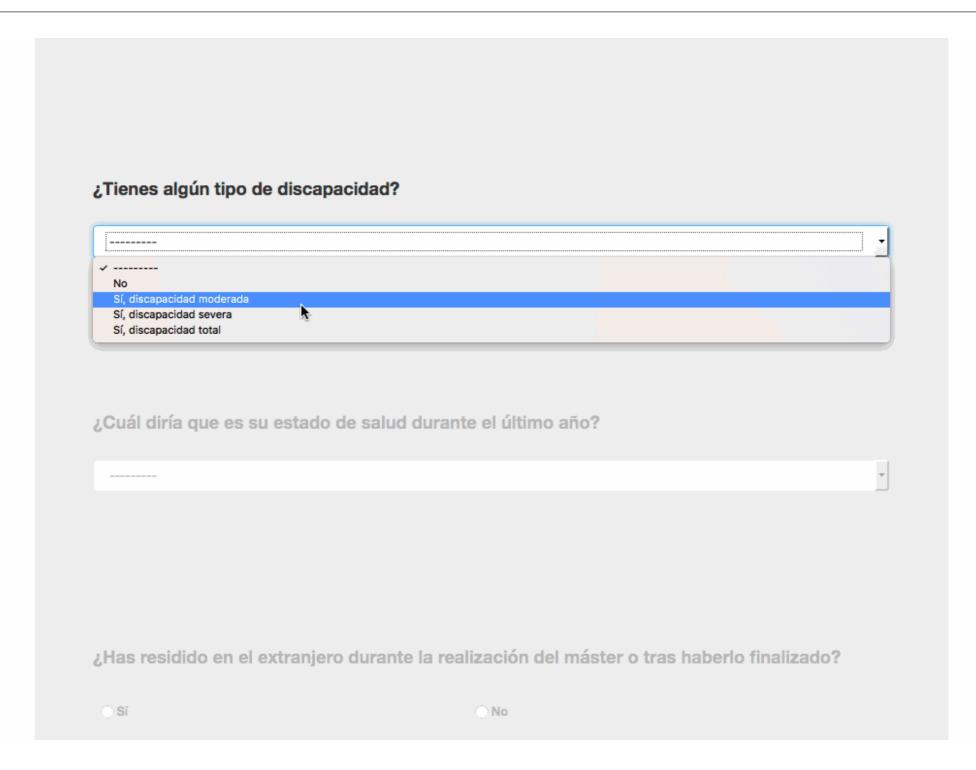*US/UX1. Inclusion of a progress bar in the questionnaire*

- By observing a progress bar, the user can know its progress in the task of filling the questionnaire and estimate how much effort/time he/she will need to make to complete it. This can reduce the stress related to uncertainty about a task like an unknown questionnaire

Proposed improvements

US/UX2. Present a visual focus animation on concrete actions

- In this case, the web provides a visual effect of focus to the user in that he will have always in the center of the screen the task to be solved (typically answering a question or filling an empty field), making also a defocused effect on the elements that are not fundamental to solve that task

Proposed improvements

Proposed improvements

US/UX3 Deactivation of control elements when an action is initiated

- A typical example of this change is to deactivate a button in a website once it is pressed until its action is finished. This usability / user experience measure could make the user to trust on the sturdiness of the system and reduce stress situations like those where a button perform the same action several times after being pressed more than once

Proposed improvements

US/UX4 In related elements, instead of having smaller and more specific groupings, use some larger grouping, following the Gestalt principles on grouping

- For example, following the proposal, the header of a table would be fixed while in the content can be scrolled up and down. It seeks to ensure that the large dimensions of analysis in some points of the questionnaire are grouped in an attempt to avoid user fatigue and reducing users' cognitive load when dealing with large tables or complex visual elements

Proposed improvements

Proposed improvements

TR4. Changes in the introduction text to the questionnaire

- In this case, a change in the text will be sought in a similar way to the modification in the invitation letter to the users. The text changes to a more personal way of addressing the user and contributing important arguments to influence a better perception on what is going to be done and improving the confidence in the questionnaire and the entity that proposes it

Proposed improvements

EN1. In the questions related to the community in which they live, change the drop-down selector for a map with the autonomous communities of Spain

- This allows the user to select where the user lives through clicking the corresponding one. In this case, it is sought to have visual elements different from the usual ones that allow the user to interact in different ways during the completion of the questionnaire and avoiding to suffer so much fatigue on the repetition of actions. Also, the usage of a map tries to reduce the users' cognitive load that implies the activity of reading a drop-down list of at least 20 items (autonomous communities and cities in Spain)

Proposed improvements

EN2. Inclusion of textual feedback related to user responses including information that may be relevant

- This inclusion of textual feedback should be placed in at least three different moments of the questionnaire (i.e. after the demographic questions, after the enquiry about whether the graduated has been employed after the master degree or not, and in the final part of the chosen itinerary), regarding the different main dropout moments. This change requires introducing an intermediate screen between two pages of questions in the questionnaire. In this intermediate screen, information in relation to some of his/her answers enabling also comparison of their answers those provided by other users or official stats from other sources, will be provided to the user

Proposed improvements

EN3. Inclusion of web push notifications that allow Observatory to send messages to users in order to encourage them if they leave the questionnaire before finishing

- These notifications can only be sent if the user explicitly accepts them. The notifications will be accompanied by the link to resume the questionnaire. From a technical point of view, the notifications will be sent to Chrome, Firefox and Safari browsers on Windows, Linux and Mac OS in desktop operative systems and to Android phones with any of those browsers (estimated total market share covered by a 61-77%)

- This measure can help to increase the users' engagement as well as to try to improve the completion ratio of the questionnaires through the reinforcement

Proposed improvements

Table 1. Relationship between each change/improvement proposed, HCI application areas and layers of Social Exchange Theory

Layer of the Social Exchange Theory	Relationship	Conversation		Appearance
Improvement area regarding HCI	Trust	Engagement	Usability / User Experience (UX)	Design
TR1	**X**			X
TR2	**X**		X	X
TR3	**X**			
US/UX 1			**X**	X
US/UX 2			**X**	X
US/UX 3	X		**X**	
US/UX 4			**X**	X
TR4	**X**	X		
EN1		**X**		X
EN2		**X**		X
EN3		**X**		

Proposed improvements

- A/B testing, at its most basic, is a way to compare two versions of something to figure out which performs better. While it is most often associated with websites and apps, the method is almost 100 years old

- The improvements will be implemented through A/B test split in 3 variants (A/B/C). The questionnaire will have 3 variants, each of them will implement some of the changes presented before

Proposed improvements

TR1. *Modify the text and appearance from the invitation letter to the questionnaire*

- This change will be implemented for all variants of the questionnaire (A/B/C)

Proposed improvements

- Variant A of the questionnaire: will be a very basic version of the questionnaire based on the questionnaire used by the Observatory in its previous study

- Variant B will include the following changes
  - *TR2. Adequacy of the image to the other digital products of the Observatory*
  - *TR3. Inclusion of the Observatory's logo and university's logo*
  - *US/UX1. Inclusion of a progress bar in the questionnaire*
  - *US/UX2. Present a visual focus animation on concrete actions*
  - *US/UX3. Deactivation of control elements when an action is initiated*
  - *US/UX4. In related elements, instead of having smaller and more specific groupings, use some larger grouping, following the Gestalt principles on grouping*

Proposed improvements

- Variant C will include the following changes

  - *TR4. Changes in the introduction text to the questionnaire*

  - *EN1. In the questions related to the community in which they live, change the drop-down selector for a map with the autonomous communities of Spain*

  - *EN2. Inclusion of textual feedback related to user responses including information that may be relevant*

  - *EN3. Inclusion of web push notifications that allow Observatory to send messages to users in order to encourage them if they leave the questionnaire be- fore finishing*

Evaluation by experts

- Five experts were invited to evaluate the proposed measures using questionnaire. These experts were selected because all of them work usually with questionnaires from different perspectives

- 4 out of 5 experts (80%) were men, 1 (20%) was woman

- Regarding the age, 3 out of 5 (60%) are between 41 and 50 years old, while other 2 experts (40%) are between 31 and 40 years old

- Regarding their knowledge areas, 3 out of 5 (60%) are related to Engineering and Architecture, while the other 2 (40%) are related to Social and Legal Sciences

- Regarding their specialization field, 3 out of 5 (60%) are related to disciplines within Computer Sciences and the other 2 (40%) are related to disciplines within Economics

Evaluation by experts

Table 2. Descriptive results from the experts' evaluation for each proposal regarding the pertinence, relevance and clarity

	Pertinence			Relevance			Clarity		
	AVG	STD	N	AVG	STD	N	AVG	STD	N
TR1	6.17	0.98	5	5.17	1.17	5	6.17	0.98	5
TR2	6.17	1.33	5	6.00	1.55	5	5.67	1.37	5
TR3	6.67	0.52	5	5.83	1.47	5	6.67	0.52	5
TR4	6.33	1.03	5	6.00	0.89	5	6.50	0.84	5
US/ UX 1	6.50	1.22	5	6.83	0.41	5	6.50	1.22	5
US/ UX 2	7.00	0.00	5	7.00	0.00	5	6.67	0.52	5
US/ UX 3	5.67	2.42	5	6.00	2.45	5	5.33	2.42	5
US/ UX 4	7.00	0.00	5	6.67	0.52	5	6.67	0.52	5
EN1	6.83	0.41	5	6.33	1.03	5	5.67	1.03	5
EN2	4.83	2.14	5	5.50	1.22	5	5.17	2.32	5
EN3	7.00	0.00	5	7.00	0.00	5	7.00	0.00	5

Evaluation by experts

Table 3. Descriptive results from the experts' evaluation for each group of proposals and global assessment regarding the pertinence, relevance and clarity

	Pertinence			Relevance			Clarity		
	AVG	STD	N	AVG	STD	N	AVG	STD	N
TR	6.24	1.00	20	5.76	1.26	20	6.24	1.04	20
US/UX	6.48	1.47	20	6.62	1.32	20	6.24	1.51	20
EN	6.19	1.64	15	6.25	1.13	15	5.88	1.67	15
Global	6.27	1.30	55	6.22	1.30	55	6.11	1.42	55

Evaluation by experts

- In general, the average mark of the assessment in each question and grouping topic could be considered as good: most of the results are in the Q1 (score 5.5)

- This Q1 score is not achieved in the proposed change EN2 (*inclusion of textual feedback related to user responses including information that may be relevant*) pertinence and clarity, TR1 (*modify the text and appearance from the invitation letter to the questionnaire*) regarding its relevance, and US/UX3 proposed change (*deactivation of control elements when an action is initiated*). These changes that did not achieve the Q1 score were reviewed again to fulfill the experts' requirements to be implemented

The experiment: some results

- Nowadays, the experiment is not finished, but we have some metrics

  - Questionnaires initiated: 5743 (12.19% of the total population)

    - Higher ratio than the previous edition 9.7%

  - Questionnaires finished: 4383 (76.32% of the total questionnaires initiated)

    - Higher ratio than the previous edition 73.94%

The experiment: some results

- Finalization metrics per vertical

    - Vertical A: 81.42% (> 73.94%)

    - Vertical B: 74.51% (> 73.94%)

    - Vertical C: 73.57% (close to 73.94%)

    Those metrics are not final, and typically will be increased in the final part of the experiment (through reinforcement to the participants)

Conclusions

- This paper presents a research focused on improving the success/completion ratio in large surveys

- In this case, the large survey is the questionnaire produced by the Spanish Observatory for University Employability and Employment and that was publicly available for graduates of masters' degree from April 2017

- This questionnaire is composed by about 32 and 60 questions and between 86 and 181 variables to be measured

- The research is based on the previous experience of a past questionnaire proposed also by the Observatory composed also by a large amount of questions and variables to be measured

Conclusions

- The researchers have designed 11 proposals for changes related to the questionnaire that could improve the users' completion and success ratios (changes that could improve the users' trust in the questionnaire, the questionnaire usability and user experience or the users' engagement to the questionnaire)

- These changes are planned to be applied in the questionnaire in two main different experiments based on A/B test methodologies that allow researchers to measure the effect of the changes in different populations and in an incremental way

- The proposed changes have been assessed by five experts through an evaluation questionnaire. In this questionnaire, researchers gathered the score of each expert regarding to the pertinence, relevance and clarity of each change proposed. 8/11 proposed changes were fully supported by them. 3/11 were reviewed by researchers and improved to be implemented

Conclusions

The experiment is currently being carried out

Preliminary results are **very positive**

Future work

- To analyze the effect of each one proposed change in the questionnaires

- Analyze the different uses of the questionnaires depending the variant in the experiment (A/B/C)

- Analyze the factors that influence the completion of the questionnaire

- Analyze the users' profiles involved in the experiment and its implication in the web form completion

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