Digital Design as a Tool to Address Awareness about School Bullying – the Nook Prototype as a Contextual Case Study

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Abstract

In the context of globalization, social change, and the ever-increasing role of digital and online media in peer relationships, the practice of bullying and cyberbullying has increased and become more prevalent in our society. The following paper describes the research journey of an applied project that aims at contributing to the analysis of the interventional possibilities of digital media in the fight against bullying and cyberbullying in the school environment, to develop a digital platform in digital format, instigating a safe environment and the search for help and emotional support, before the institution's psychologist, on the part of victims and whistleblowers.

To develop the theoretical framework for the applied project, a literature review was conducted to understand the current situation of these phenomena in society, the digital impact and its role in social problems and the behavior of online users. Simultaneously, the research included the deepening of understanding the principles of UX/UI Design and Design Thinking methodologies, that bridge to the practical implementation of the research.

After participant observation, in which there was direct communication with the school and other entities, the platform, branded Nook, was developed using various methodologies, including the construction of personas, information architecture, visual identity, wireframes/workflows, prototyping, usability tests based on the adapted SUS methodology and, finally, analysis of the results obtained.

With the development of this platform, prioritizing user-centered design, the aim was to enable an intervention and prevention option for victims of this type of violence in the current Portuguese education system, through constant evolution of the platform, considering user feedback and suggestions for improvement.

Keywords: *bullying; cyberbullyng; digital communication; digital design*

1. Introduction

The following paper presents the development of "Nook", an applied project that aims to contribute to the analysis of the interventional possibilities of digital media in the fight against bullying and cyberbullying in the school environment, to develop a digital platform in digital format. Nook is a work-in-progress project that is currently analysing the best strategies for project implementation, taking into account the work carried out and the benchmarking of online platforms that are informative media in defining the issue of bullying and, by relation, cyberbullying [3].

Since the school is a place where there is a strong influence on the construction of children's and adolescents' identities, it is also possible to realise that the school is a transformative place in terms of conflicts and tensions [4]. Therefore, a series of specific objectives were defined in order to detail all the steps to achieve the general objective, such as (a) analyse bullying in the Portuguese context and identify the means used against the victim; (b) determine if there is any type of digital platform as a tool to support bullying; (c) determine what information needs to be included in the victim or whistleblower form; (d) contact institutions and associations involved in the fight against bullying and establish direct contact with schools to carry out further data collection; (e) develop a digital platform to support victims of bullying in the school environment, including informational content; (f) design a series of usability tests (carried out by both students and other informants) to understand the practicality and relevance of the platform.

These objectives conducted the theoretical framework for the literature review and its translation towards the practical implementation of this research.

2. Fieldwork: Participant Observation

For the development of the fieldwork, which was organised in different phases during 2022, the National Bullying Observatory of Portugal and the K6 and K9 school of Pevidém (in the city of Guimarães, Portugal) were involved in order to assess the possibility of institutional support and the relevance of the project. First, semi-structured interviews were conducted to introduce and challenge the project and to avoid going into unnecessary questions. Various suggestions were made about how the platform should work, who it should reach and how it should respect the general data protection law.

The contact with the Pevidém school materialised the territory for the practical study, with intervention communities with students, families and school psychologists. Once the project was accepted by the institution, the next step was to create the platform and select the school years in which the platform tests would be carried out. Together with the school psychologist, the most appropriate age groups were chosen in order to create a balance between ages without discrepancies. Years 6 and 8 were therefore chosen, with ages ranging from 11 to 14. Next, the classes were defined and the students were randomly selected through face-to-face elections in each class. Five students were selected from each class, following the methodology of the Norman Nielsen Group [5]. The dates for the first and second phases of the usability tests were then set, one month apart. Parents and guardians were immediately given permission to conduct the tests.

Regarding the interaction with families, the idea of carrying out the tests with the school's Parents' Association was discussed, but for bureaucratic reasons and lack of people, the option of carrying out the tests with a group of teachers from the school emerged, with the advantage that they would always meet on the same day and at the same time in the morning. With regard to the usability tests for psychologists, it was agreed with the psychologist that of the five users, two would be herself and her colleague from the same school group in the first cycle, and a network of contacts was created to ensure the participation of three more.

Finally, a questionnaire was developed for the website with the help of the psychologist to complete the information phase. In order to prepare the questionnaire available on the "Nook" platform, several questionnaires were studied and then the questionnaire was created, making it essential to cover both phenomena. From a medical-psychological point of view, the psychologists themselves will receive an in-depth analysis of each case they will analyse in the future.

3. Digital Design Project

The project has been developed within the framework of research and has been adapted for evaluation according to the methodologies of Design Thinking, UX/UI Design and SUS [6]. In this way, the digital can be used by all educational actors to allow accessibility and speed through efficient platforms designed to combat the problem.

It was developed using digital design methodologies and best practices, including the development of four personas, defined after several meetings with the institutions, where gender and age represent the arithmetic mean of the ages of the different users. It was also necessary to create different descriptions, goals and solutions for each persona in order to better understand the needs of each user and make development decisions based on those needs.

Once the personas had been researched and created, the next phase was to consider the information architecture. Based on the fieldwork conducted and the four different types of personas defined, it proved appropriate to develop three individual organisational charts: students, parents and psychologists. The main objectives of the student user are quick access to the platform or to the immediate resource "I need support" and to get help through the platform. It was necessary to create an initial questionnaire to filter the situation and to include a chat and access to the information centre.
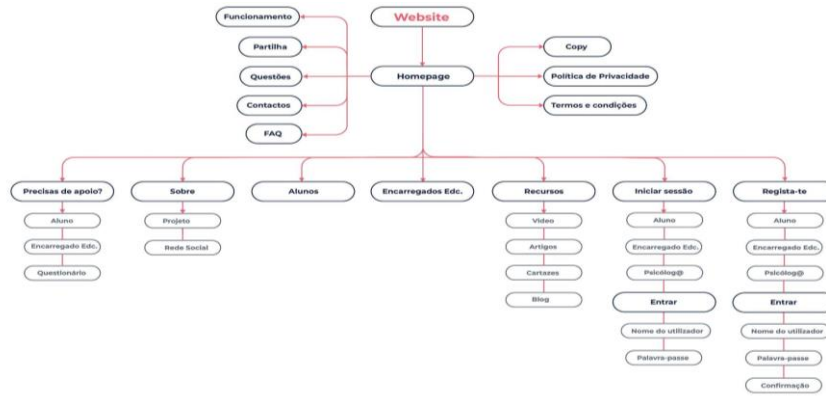
Fig.1. Homepage information architecture organisational chart.

The next steps were design-wise, namely visual branding, wireframes and workflows, and high-fidelity prototyping. A high-fidelity prototype of the key interactions was designed to complete each case study. The Figma digital platform, a graphical interface prototyping platform that allows the creation of interactions and animations, was used to create a more interactive prototype for the development of the 'Nook' platform interface design. One of the key factors in the development of the Hi-Fi prototype was that it was possible to obtain a greater amount of data to contribute to the greater functionality of the platform with different users, and the different element of age and their needs helped to create a prototype that was close to the final prototype, as shown in Figures 2 and 3.

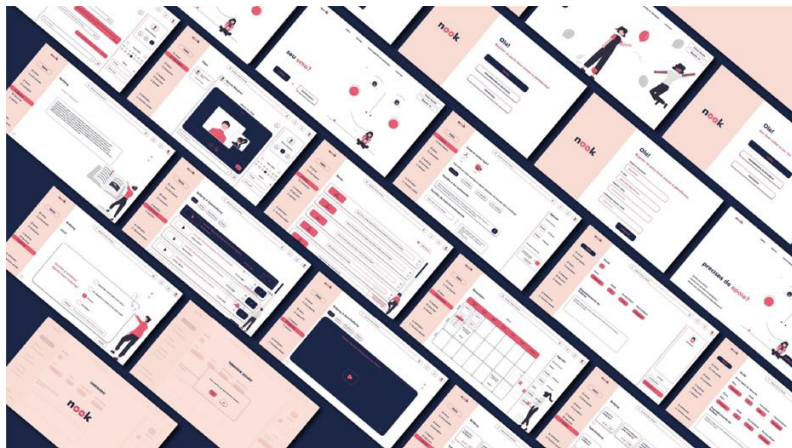
Fig.2. Interface design and digital grid.

Fig.3. Overview of the Nook platform's Student/Families interface.

4. Analysis and Results

Usability tests make it possible to observe the behaviour of different groups of users in relation to the interface by carrying out tasks that allow each user to be assessed individually. The usability tests were carried out using the 'Why you only need to test with 5 users' methodology [5], which brings together a group of five users. Thus, the methodology was applied to three target groups: 6th and 8th grade students, parents and psychologists, ranging in age from 11 to 65. The tests were carried out on five users close to each persona, with a high-fidelity prototype for detailed evaluation in order to arrive at a final solution. The usability tests were divided into two phases.

During this phase, the usability tests consisted of observing the users' behavioural reactions as they interacted with the interface, asking each of them to read a script to be used during the tests, which included a list of tasks of increasing difficulty to indicate the difficulties encountered along the different paths.

After testing, each user was presented with a short anonymous questionnaire adapted from the System Usability Scale (SUS) methodology developed by John Brook. The SUS is a Likert scale based on statements of agreement or disagreement, chosen with care to avoid the inclusion of extreme attitudes. The same scale is usually used after testing the system and without any follow-up discussion to ensure the influence of the responses [6].

The questionnaire was administered to each user immediately after the end of each usability test. The average duration of the tests for each user was 5 minutes, conducted personally and individually at the school. First, a brief presentation of the platform and the framework of each profile was given according to each task presented in the script, and the users were asked to indicate any difficulties and improvements to the platform.

Analysing the data between the first and second phases, using the adapted SUS questionnaire, showed that users found the platform intuitive and easy to use, and that all users took the initiative to carry out another usability test. While the average percentage in the first phase was 91.5, this rose to 97 in the second phase, resulting in a grade of 'A', describing the platform as 'Best Imaginable' in terms of usability.

The first phase of usability testing was aimed at the 8th grade class and the first reactions and comments on the platform were very satisfactory, with each student taking an average of five minutes to complete the test. In this sense, improvements were made to the prototype and some changes were recommended by the students regarding the increase in icons. We then moved on to the second phase of testing to understand the improvements made to the platform. After completing the four tasks, they were asked to complete two more tasks to create a greater level of difficulty, but the users maintained a positive performance in the second phase. It was understood that the level of familiarity was greater, guaranteeing better performance in the final test.

With regard to the first phase of the usability tests for the 6th grade class, it was noticeable in the first task that all the users found it quite easy. In general, the first phase of the tests, the results and the feedback from the users were quite positive, with the SUS results being the minimum value and the maximum value of 95%. After some difficulties in some tasks, some modifications recommended by the students regarding the "hang up video call" were taken into account and adapted to a similarity with the zoom platform in order to obtain a greater improvement for the final prototype. The values of the first and second phases of testing, where it is possible to observe a greater level of satisfaction and also familiarity that users respond to the platform and the tasks proposed. The average values for the first phase reached 92.5 per cent, and in the second phase the values reached 97 per cent, confirming the improvement of the design.

The usability tests for families and parents had the same aim of identifying the main problems with the interface, using the same type of tasks and the same structure as the post-questionnaire. Each task took an average of four minutes per user to complete. Overall, the feedback from parent users was positive. 90% of users found the platform intuitive and visually appealing. In the second phase of testing, in addition to the four main tasks, users quickly took on two additional tasks, which allowed for greater navigation through the platform. The average score achieved in the first phase of testing was around 100%, but in the second phase of testing the average score increased to 96%, which also results in an 'A' score, meaning that the platform is easy to use and acceptable in terms of usability.

With regard to usability testing for psychologists, the methodology is similar to that for students and carers, but the list of tasks and the script have been modified to take into account that the content of the interface is different for this target group. Maintaining the level of difficulty from task to task in order to detect difficulties along the different paths. Users' reactions during the first phase of testing were very positive. Each task took an average of two minutes per user.

As for the second testing phase, the same tasks were carried out on the data collected in the first phase. After making improvements according to the data collected, the second phase was carried out in which the improvements were understood, working together towards better navigation on the platform in each proposed task. After this session, some improvements were made, such as the integration of a vertical scroll bar.

Finally, in the first testing phase, quantitative values were obtained, where it is possible to see an average value for the five users of around 90.5%, a value that leads to an "A" grade, labelled "Best Imaginable", which visibly confirms a positive result and an intuitive and practical platform. In the second phase of testing, the average rose to 92.5 per cent, also an 'A' grade.

5. Conclusion

There is a clear need to implement an active platform for intervention and prevention of this type of violence. Digital design therefore has the potential to be used by all these educational actors in a way that allows accessibility and speed through objectively designed platforms to combat the problem.

The different design strategies that must be taken into account for a good user experience, encompassing different types of users, are: the inclusion of simplicity, ease of navigation and focus on the main needs they are looking for, with the integration of emotional response and also empathy towards the platform and the user. One of the essential factors in achieving a good result in this project was the implementation of user-centred design, which provided a platform with a solution to combat bullying in a school environment. The study of usability tests allowed the different users to better perceive the relevance of the platform and to understand the improvements made during the testing phases.

In conclusion, after a long research project, it should be emphasised that it has made a significant contribution to the literature on bullying and cyberbullying. It is also worth highlighting the acquisition of skills in different specificities with different target audiences, beneficial for the performance of the profession of designer, more specifically designer of digital products.

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