

**Evaluating a mobile mental health website using design methods and employing the User
Engagement Scale**

A case study

Name: Naoise Kavanagh

Student ID: N00153173

Academic Supervisor(s): Grainne Kirwan

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Contents

Introduction and literature review	4
Putting the user at the centre.....	4
User experience	5
Expectation and context of use	5
Usability vs experience and engagement	7
Engagement with digital health interventions.....	8
Interface design	9
Accessibility.....	10
Online mental health support.....	10
Personas and stories	11
Introducing the User Engagement Scale (UES) as a measure	11
Methodology.....	13
Design.....	13
Participants	13
Materials	13
Procedure.....	14
Ethics.....	16
Results.....	18
Findability/usability: Navigation, menu system and location.....	19
Menu and visibility.....	20
Findability/Usability: Site search.....	21
Findability/Usability: Search terms.....	22
Findability/Usability: Triggers	22
Accessibility: access to features.....	23
Accessibility: features and tools	24
Accessibility: Content, language and layout	25
Tailored content: moving away from the universal approach.....	26
Trust and awareness of credible sources.....	27
Results of UES (sf) scale	28
Discussion	30
Moving away from the universal approach	30
Moving away from the universal approach	30
Ease of use: Navigation and location	30
Using in the User Engagement Scale (sf)	31

Limitations	31
Further research	32
Conclusion.....	32
References	33
Appendix A. Persona 1 Meave, 21	39
Appendix B. Persona 2 Micheal, 19	40
Appendix C Persona 3: Stephen.....	42
Appendix D. Persona 4. Helen 23.....	43
Appendix E : User engagement scale short form.....	44

Introduction and literature review

The World Health Organization (2019) claims that around 20% of the world's child and adolescent population experience mental health issues. Despite this prevalence and growing awareness, many young people do not get the support they need at this time.

Government bodies and mental health organisations are actively exploring online or mobile solutions that scale to meet the increasing demand for support services. Mental health problems have a significant impact on education, work performance, and social interactions (WHO 2019) and therefore comes at a great cost to society in general.

Mental health services delivered online can not only scale but can also overcome obstacles to help-seeking such as location, stigma, negative perceptions and cost, known barriers to young people seeking help from traditional services. (Salaheddin and Mason 2016).

For many young people, going online for support can often be the first step when experiencing distress (My World 2012; Pretorius et al, 2019; Feng and Campbell 2011; Karwig et. al 2015) turning to a search engine, with Google being the most popular (Pretorius et. al 2019). While this action can deliver many results for a user, quality resources from a trusted source (Biddle 2018) can be hard to find with the credibility of information being important to many users (Stoyan et al 2015; Karwig et al 2015) but can be difficult to verify.

Putting the user at the centre

Being empathetic to a user's needs and putting them at the centre is required to develop effective, useful tools and products (Babich, Adobe 2019), particularly when looking at help-seeking and help-getting. Talking directly with users delivers specific insights about the context of use of services and products and helps 'design with people and not for them' (Reason 2016). Involving users from the outset of development and creating a feedback loop is necessary, keeping users engaged (Babich, Adobe 2019).

Empathetic design broadens knowledge beyond a task orientated focus and without judgement aims to understand a user's motivations and intent (Kouprie and Visser 2009).

Gaining an understanding young person's environment and potential challenges they may face is crucial in the provision of effective support (Doorley 2012, 2019).

User experience

As the terms user experience and usability have become fashionable over the years, development projects put a lot of emphasis on discovery of user goals (Allison et al, 2019) and how easily they can be achieved onscreen (Frost 2020). This leads to user interface design focusing on typography, form, buttons, and web page or screen components. This is often at the expense of investigation wider context, motivation, or previous experience of using a digital product or item. (Allison et al 2019)

The area of user experience has evolved beyond assessing usability task performance to look at the quality, satisfaction, and human element around a user's interaction with a digital product (Hassenzahl 2008, 2010, Nilesen 2020).

As Nielsen (1994, 2020) says to developers and designers be mindful that users "spend most of their time on other people's products and not yours". This means aiming to design without creating friction or adding to a users' cognitive load and moving with convention, delivering consistency information hierarchy, language and how content is displayed on screen, such as imagery, tabbed or accordion formats. (Frost 2021)

When it comes to mental health support websites, the self-directed nature can be attractive to users who are help-seeking for the first time or looking for information to help support someone else (Doorley 2012, 2019; Pretorius 2019). When a person is help-seeking they may be feeling low and therefore be experiencing poor motivation and concentration levels (Zhang et al 2019), making a supportive digital experience inclusive, attractive and easy to use is all the more important.

Expectation and context of use

Site speed is frequently reported as one of the most important factors in a user's experience with "Fast is better than slow" being one of Google's mantras (Jones et al 2014). Slow

response times is a particular hindrance to mobile websites and multimedia use (Jones et al 2014) where there can be a sense of urgency. More frequently, users want and expect more tailored personalised content, along with mechanisms to customise, made available to them. (Ng et. al 2019; Thielsch & Thielsch 2018; Pretorius 2019)

Being served unexpected or irrelevant content creates a poor experience for many users, but can particularly hinder those feeling distress and help-seeking (Bernard et.al 2019) with 'findability' being a crucial to usability (Allison et. al 2019; UXmatters 2012). As the internet continues to grow and trusted sources have difficulties keeping up with promotion and search algorithms (Biddle et al, 2018) being served irrelevant content is more and more likely. In addition, users can take action by accident (Nielsen 2020) and end up on unchosen paths, particularly with touchscreen technology on smaller screens.

When it comes to mobile access through an app or even a mobile, a much broader context comes into play for a user's experience. The search intent, or drivers to access an online tool or website means a user could be anywhere (Jones et al, 2014).

Greater attention is required for functional design for touchscreens, to have ample target size (WCAG, UXMatters) for components on screen like buttons, accordion formats and drop down menus (Nilesen 2020). In cases where users are traveling on a bus or train for example they may be unable to keep their screen still, so elements, such as links, buttons and form fields must be large enough to use but also not too close together (UXMatters 2019; Esoldo Topal.com; WCAG). Not only that, but mobile and touchscreen technology by their nature create more issues for accessibility, as a desktop setup allows for great control and use of technology enabled tools for physical or visual impairments that may interfere with access. (WCAG, Interaction Design Foundation 2020)

When a person conducts a Google search about something bothering them (Pretorius et. al 2019), if they are on a phone no assumptions can be made about their physical environment, compared to that of a desktop search. This needs to be accounted for how something is used or consumed, particularly content of a sensitive nature.

The prevalence of smartphones means in-depth and rich insights are necessary (Yardley et. al 2016) to look at how and where people are when they are help-seeking and help-getting online.

Although there widespread acceptance of digital mental health interventions favouring a low commitment self-guided approach, certain types of health seeker prefer online as a tool for human connection (Baghaei et al 2019; Pretorious et al 2019).

Often, digital mental health interventions do not maximise the nature of interactivity the online space can afford them (Lyon 2020). Users are frequently present with dated layouts, tools and content, when nowadays, young people have increased expectations of engaging design and interactive experiences as freely available elsewhere online. It is reassuring though for organisations or mental health professionals delivering online interventions with limited technology or design resources Thielsch and Thielsch (2014, 2018) found that content had the greatest effect on whether a user would return to mental health website or app.

Usability vs experience and engagement

Many UX practitioners question the value of many of the widely used measures for engagement but it is now acknowledge that a blend of methods are needed, with much consideration required to choose the right fit, particularly with digital behaviour change interventions (Yardley et. al 2016). Analytics such as users, time spent, journeys are used to review behaviour on websites and apps but relying on these metrics alone does not give the full picture of the experience for a user. Features that users engage with frequently on a site or app can be considered effective and successful due to frequency of use, but does not deliver a real indicator of a users' satisfaction. (Perski et. al 2017)

Good engagement, indicating how invested a user is in the use of a digital system can be measured by working with actual users to participate in the design and evaluate (O'Brien et al. 2018, Adobe 2019), to get a sense of what is actually working and why, looking beyond superficial engagement metrics such as time spent and abandonment rates.

While the terms user centred or human centred design, usability, user experience or engagement and now recently 'design thinking' can be used interchangeably in the literature they are understood to cover the following factors in a product or service design: ease of use, usefulness, content, appearance, interactivity and satisfaction (UXmatters, ISO 2019, Interactive design, Allison et al 2019).

Engagement with digital health interventions

Engagement can be looked at as a subjective experience or behaviour (Perski et. al 2017) when it comes to digital behaviour change interventions. The motivation of a user is shown to effect engagement with online mental health products (Perski et. al 2017; Zhang et. al 2019; Bernard et.al 2019) as mostly of these offerings are reliant on self-direction or self-guided use. Low engagement has been shown to negatively impact how effective an online intervention can be (Alqahtani & Orji 2020), and therefore motivation and context of use, usability and experience need to be fully understood for optimum design of a support tool (Cole et al, 2019)

While site metrics that measure behavioural engagement such as users, sessions and time spent are considered universal measures of an app or website, much of the literature calls for the exploration into the wider context and motivation for use, but often studies don't look at all areas at once. As in the case of Zhang et al. (2019) looking at self-directed activities did not take perceived usefulness into account, so it cannot be assumed that users would see the value in the activities alone. Can a well-designed experience make up for a lack of user motivation?

Difficulties in use and access with little personal control over systems online are common causes of frustration people (Alqahtani & Orji 2020) who are experiencing depression or anxiety (Bernard et al 2019) and may result in discontinued use. When it comes to design of content or layout for mental health digital products, it should be factored in that the user may not actually want to be there.

There is currently not enough relevant global evidence to account for the low engagement and high attrition reported on mental health and wellbeing websites and apps (Alqahtani and Orji 2020) therefore, exploration of context of use could have a huge role to play here. Having an understanding what online behaviour signifies a positive experience, as some online metrics can give the wrong impression, or lead to incorrect assumptions (O'Brien et al, 2016; Yardley et al, 2016). Time spent is often considered an indicator of enjoyment or having an immersive experience but it could also be a sign of frustration and being unable to locate what was desired (O'Brien et al, 2016, 2018).

Interface design

The strongest influence on a user's experience is 'ease of use' has been consistently cited as so in growing body of evidence (UXmatters 2012, Nielsen 2020) but even how easy something is to use is subjective, as previous experience and environment all have their part to play. This highlights the need to explore the context of how it impacts the way they use a product or service.

While there have been many required shifts and changes to adapt for mobile design, some of the core principles of usability remain the same as can be seen through the work of Nielsen with his 10 Usability Heuristics for User Interface Design. He published these guiding principles for effective interactive design in 1994, and updated in 2020 ultimately unchanged but with supplementary links to how to apply them to different areas of design. Nan and Kong (2016) noted that many studies evaluating web and interface design tested them with participants using desktop computers. While this makes it easier to see what the participants are doing in an observational study, so many of these studies do not account for the differences and challenges in design for a smaller screen (Nan & Kong 2016).

Moving through a desktop website a larger screen and the accuracy of using a mouse and a cursor is very different to navigation while browsing online or moving through a mobile website that relies on tapping, swiping and expanding to zoom with one's fingers. A mobile site needs to have large areas that require interaction with enough space around them – known as target sizes - to allow for strong and clear responses from navigation and features. (UXMatters 2019; Esoldo Topal.com; WCAG)

Unfortunately, when it comes to digital mental health interventions, content is often developed independently of the technology that houses it which can create an unconnected experience for the user (Lyon et al 2020). Baghaei et al (2019) indicated that previous experience of mental health difficulties were not shown to have any impact on user preference for interface design although Thielsch and Thielsch (2018) found that current depressive symptoms did have a negative impact on a user's experience.

Usability and aesthetic appeal have often been linked in user perception of usefulness in mental health website and app evaluations but less so when the assessment was conducted after use. (Thielsch & Thielsch 2018)

Accessibility

The term accessibility has come to mean many things when it comes to website and app design and development but ultimately is about making online offerings available to users with disabilities, with stringent requirements as developed by Web Content Accessibility Guidelines (WCAG). This means a number of technical things such as use of tags and mark ups for screen readers, clear labelling and images replacement, sufficient contrast with use of colour for readability. (WCAG; Van Toll 2014)

While the term accessibility is used in a number of different ways when it comes to content or indeed service design, (Thielsch & Thielsch 2018) it often refers to inclusive and engaging content along with literally ease of access.

Online mental health support

Mental health websites often provide information and support through self-help content and features for self-direction with evidence proving effective results, comparable in some cases to face-to-face delivery (Cuijpers et. al 2010) depending on the context. Intervention that do not involve connecting with another person, relying on self-direction can be an attractive offering to certain help-seekers, such as information seekers or people in crisis and experiencing suicidal ideation. (Biddle et al 2018; Pretorius et. al 2019, 2020)

Personas and stories

Utilising personas and user stories as highlighted by Miaskiewicz, T. and Kozar, K.A. (2011) can help to deliver empathetic design, while also accounting for different activities that may not come up when relying on real-life experiences.

Personas are fictitious and “represent an aggregate of target users who share common behavioral characteristics” (Pruitt and Adlin, 2010). Stories are scenarios used a device to illustrate steps involved that a user would need to take to achieve a goal. (IDEO-U, Design Kit). Working with participants to take on the role of a persona when measuring and evaluating mental health websites (Pretorius et. al 2020) and apps removes the need to share any personal issues, supporting confidentiality, while still bringing expectations from previous experiences. Using personas and stories can illuminate users’ needs and goals by presenting specific scenarios (Long 2009) to synthesise a number of different user journeys.

Group interviews or workshops with a sample of potential users are an effective and valuable part of participative and frequently used method taking a user centred design approach (IDEO-U, Design Kit, Young and Well Research Center Hagan et al, 2012) investigation of emotional responses from users. (IDEO ISO 2019)

Introducing the User Engagement Scale (UES) as a measure

Engagement is a common goal and measurement for a website’s or app’s success (Imwali 2017). What engagement actually is though can be different depending on the online offering. For example if a website or app has a number of input fields and forms, reviewing what was and what not submitted and by a user can give a strong indication of engagement. On information sites engagement is often measured by dwell times, pages or screens per visit. Currently a range of measures for engagement are in use for digital health interventions (Yardley et. al 2016) such as satisfaction surveys, and user behaviour through online metrics but there are challenges with comparing like for like without consensus on engagement.

The User Engagement Scale developed by O’Brien et al (2010, 2016, 2018) was originally devised for use in the ecommerce domain. Developed over many iterations, it has now been refined and used across a wide range of domains, beyond ecommerce, such as education,

video and gaming. The full scale is a 31 item questionnaire and has six distinct areas: focused attention; perceived usability; aesthetic appeal; durability, novelty and felt involvement.

O'Brien et. al (2018) noted potential for participant fatigue with this long form and after observing its use, refined a shorter 12 item scale. Both the long and newer refined short form look at four areas of factors: focused attention – absorption, holding attention; perceived usability – usefulness and worthy of effort; aesthetic appeal – engaging appearance; and reward – success and satisfaction for use. This short form of this scale is far more transferable to different domains and employed for this research project.

This UES has already been shown to be an effective a measure for health apps, being found to be particularly reliable the areas of focused attention, aesthetic appeal and reward (Holder et. al 2020) but less so for perceived usability.

Methodology

Design

This research study's aim was to work with young people, using personas and stories as outlined by Miaskiewicz and Kozar (2011) to evaluate the usability experience and engagement of using a mobile enabled mental health website.

At each focus group/workshop participants undertook a number of usability task based on scenarios under the guise of their personas and finished the session by taking O'Brien et. al's User Engagement Scale short form (2018) and repeating the survey a day later, while they were unobserved.

Participants

Nine young people, based around Ireland, aged between 18 – 25 years-old took part in four workshops. Participants were recruited through the volunteer Jigsaw Youth Advisory Panel Network from around Ireland. Initially, 12 young people were recruited but time commitments meant only nine were able to actually attend.

Materials

Covid-19 restrictions prevented the opportunity for in person workshops, and so they were therefore held over Zoom conference calls.

An information sheet about the research study along with a briefing document and shared with participants before the workshops were held, these were hosted on IADT's OneDrive along with a consent form.

A different predesigned persona was introduced at the beginning of each workshop, and time was spent getting to know the personas and plot out some user goals. Designed in Power point using stock images, based on archetypes of young people in Ireland experiencing feelings of distress. These personas were designed, using the IDEO Design Kit framework for persona development, in consultation with volunteers from Jigsaw's Youth Advisory Panel, and submitted along with it ethics application for approval to IADT. The volunteers involved in this development were not involved with the workshops. User goal mapping tables in a table format in Power point, were also used during the workshop, and

were shared onscreen so inputs were added live and were visible to all as the participants tried to fulfil these goals on their phones, while talking aloud about their perceptions. The workshop ended with the participants taking the User Engagement Scale (UES) (O'Brien et al. (O'Brien et al, 2018) short form questionnaire, a 12 item questionnaire using a five point Likert scale for each answer and were asked to take the questionnaire again the following day.

The UES original questionnaire has 31 items and was developed for the use in the ecommerce sector looking at six distinct areas: focused attention, perceived usability, aesthetic appeal, endurance, novelty and felt involvement.

O'Brien et. al (2018) refined and amended the scale over a number of iterations and observing its use, resulting two scales, a long form and a shorter 12 item scale, looking at four areas: aesthetic appeal, focused attention, perceived usability, and reward. This is The questionnaire, along with the information sheets and consent forms were hosted on IADT's OneDrive.

The questions in the UES sf scale are to derive a score in four areas: focused attention, perceived usability, aesthetic appeal and reward by adding scores

During the pilot phase of this research, a number of online collaboration tools were trialled for use during the workshops to synthesise what would happen in an in-person workshop as had been originally planned. All activities had been planned for one individual workshop held in-person with four groups working simultaneously and recorded. While materials such as consent form, debriefs and surveys were hosted on IADT's, the use Microsoft Teams was problematic in the pilot phase and therefore workshops were held over Zoom.

Procedure

The study workshops were conducted with nine participants, working in groups over four separate Zoom conference calls. All participants arrived on Zoom calls and were briefed about the objectives of the study with the structure outlined. Asked to read the briefing document and information sheet again at the beginning of the workshop. There was no requirement required to divulge any personal information about their own mental health,

and nothing discussed, or that arose was to be talked about outside of the workshop and this was made clear from the outset. Each person attending gave their real name and age by way of introduction as some of the participants know each other, or have heard of each other, due to the nature of their relationship with Jigsaw.

A 'persona' a fictitious profile of a type of user of a youth mental health website was used for each workshop. These were fabricated profiles based on prototypes of young people; Helen, Meabh, Stephen and Micheal aged between 19 and 23 years-old and living in Ireland. Each one were experiencing a type of distress: (Meabh) having difficulty sleeping and eating (Helen), recognising the feelings of anxiety and low mood (Stephen) and feelings of stress and being overwhelmed (Michael). Not all personas had heard of Jigsaw before, and two have had sought mental health support before and two had not. These personas, along with their scenarios were created prior to the Covid-19 pandemic and submitted as part of the study's ethics' application. Restrictions were acknowledged as being somewhat relevant in all of the workshop scenarios, as there would be likely that Covid-19 related content would be a part of some users' journeys.

Once the groups had an understanding of their personas they explored what their goals might be in terms of help-seeking. These were input on screen live, so could be viewable by all.

Each person attempted to achieve these goals on Jigsaw.ie on their phones, while on the Zoom call, prompted to talk aloud about their impressions while doing so.

In a synthesised situation, ie a focus group, how someone responds on the spot to a can differ widely from how they feel after a period of reflection, or just time away (O'Brien et. al 2018). Participants were therefore required to take the questionnaire at two different time points, once at the end of the workshop and a day later, through a follow up email. Each participant was allocated a unique identifier related to their persona's name; Stephen 1, Stephen 2 etc.

Each session was recorded and transcribed and thematic analysis was conducted on the transcriptions, employing coding technique as outlined by White and Devitt (2021) through breakdown of such process drawing on work from Corbin and Strauss (2008).

The results of the survey were scored as per instructions from O'Brien et. al with a median score for each area of focus: aesthetic appeal, focused attention, perceived usability, and reward. Reverser scoring was applied, as directed, the perceived usability subscale.

Cronbach's alpha was employed to the survey results using Microsoft Excel from respondents at two different time points.

Ethics

All participants recruited for this study were over the age of 18 years-old. However, the area of mental health, wellbeing and help-seeking is at the core of this study and is a sensitive topic so all duty of care was taken to ensure no felt any distress during the workshops. The use of personas, noting that no one need divulge any personal mental health difficulties or that of their young person and making all participants aware of support available to them if they found any of the subject matter distressing helped set a neutral space for participants.

Participants were told about the sensitive nature of the content of the study beforehand when recruited and asked to consider this when deciding whether to participate. It was specifically requested that no participant discuss their own mental health throughout the workshop, all insights were to be gained through the perspective specific workshop persona. The survey results were all anonymous and only accessible by the researcher and supervisor.

This research approved by the Department of Technology and Psychology Ethics Committee (DTPEC) at IADT, Dun Laoghaire, Co. Dublin. The study was deemed to be exempt of a full review by the ethics committee in Jigsaw and confidentially about taking part was assured. Members of the Youth Advisory Panel have provided consent to take part in research as part of their commitment to Jigsaw, but they do have the choice about when they participate.

Participants were informed during the recruitment phase about the study objectives and also briefed before and at the outset of the focus group before giving consent and debriefed at the end. The use of personas supported confidentiality, and participants were made aware of a Jigsaw Clinician to contact would make themselves available, were any distress to occur due to taking part in the study. All care was taken to avoid any undue harm come to anyone who took part in the study as per the PSI Code of Professional Ethics by keeping all responses related to that of the persona and not a personal nature and the questionnaires were anonymous with no link from participant to email addresses.

The recordings of the workshops were transcribed and thematic analysis was conducted on the text scripts alone, which was attributed to the workshop persona and no longer linking any comments to any individuals.

Results

Nine young people took part in four workshops; three young participants attended the first one and two young people attended each of the further three workshops. Three participants were recruited for each of the four workshops but due to time constraints, three were unable to attend, so workshop times were moved around so that there would still be four sessions and four personas that had received ethical approval were used. Two young men attended the first workshop but apart from that, all the other participants were young women ($n=7$).

Each scenario presented was about reaching for the phone on a commute, or at night or at a point of recognising things are getting to be too much from becoming overwhelmed with: too much on and recognising signs and triggers of anxiety from a prior experiences. Things have culminated with our four fictitious young people and it is affecting them in ways such as, being tired all the time, unable to concentrate, (Meabh) having difficulty sleeping and eating (Helen), recognising the feelings of anxiety and low mood (Stephen) and feelings of stress and being overwhelmed (Michael). Participants were on a mix of android and iPhones and different versions of each.

Participants then tried to take actions on Jigsaw.ie to fulfil the needs' of their personas and the following are the main themes that came up across the workshops while attempting to undertake these tasks on their phones. While there is cross over in many themes, each one highlighted here is done so, due the challenges or achievements that occurred when attempting to fulfil usability tasks.

Table 1. Themes and subthemes

Theme	Sub themes
Ease of use/usability	Navigation Menus titles and location Visibility
Findability	Site search

	Search terms Triggers
Accessibility	Access to features on the site Accessibility tool Content and layout
Tailored content	Relevant content Content Personalised content
Trust	Awareness of trust Credible sources

Findability/usability: Navigation, menu system and location

When viewing jigsaw.ie on mobile the primary navigation is accessible via hamburger menu – three lines, now a universal icon for mobile menus – and is located at the bottom right of the screen in a small orange circle, placed on a horizontal grey menu with three items; Search; Get support and Donate, across the bottom of the screen. The main footer menu of the website is another shade of grey, as shown in image 1, created visibility issues for many of the participants. Some participants ($n=2$) did not notice the horizontal menu at all and therefore missed the hamburger menu to access the primary navigation along with the search function. When prompted to view this menu two these participants expressed surprise and explicitly said they expect this menu to be in the top right or left so did not think to look at the bottom of the screen. They claimed a habit of consciously looking at the top of the screen when scrolling, so never noticed the horizontal menu contrasting against the content.

“Oh, I didn’t see that there all, I normally look at the top of the screen”

Michael’s group

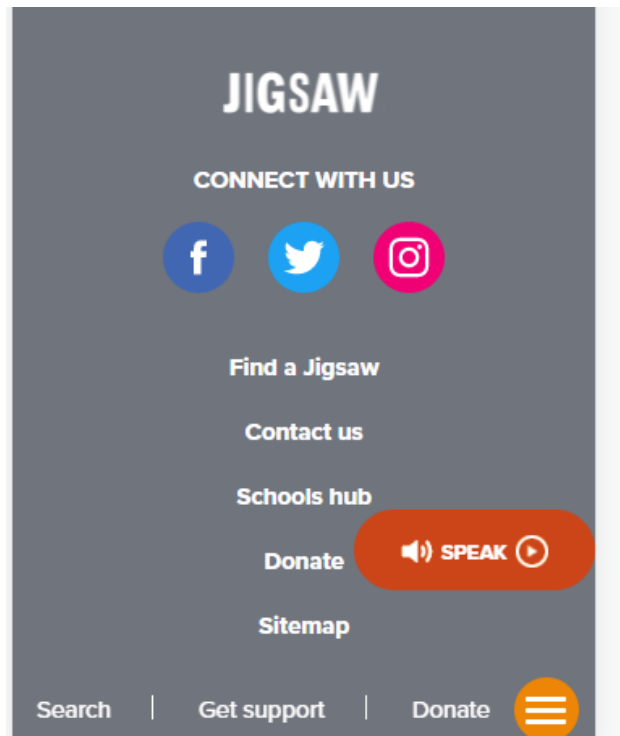


Image 1: Horizontal menu, footer menu and access to primary navigation

Menu and visibility

Other participants ($n=2$) used the sticky horizontal menu as a first port of call from homepage namely the 'search' field and the 'get support' items – but did not use the hamburger menu.

Longer articles that use anchor jumps were appreciated, in particular “managing anxiety” were titles allowed the user to move around the page without having to scroll were considered really helpful.

The site's Live Chat function is a tool that facilitates clinical synchronous support, is hosted on a page with a banner image, introductory text with opening hours, a button to login and an accordion style layout for terms and conditions in text format, as shown in Image 2. As this content is underneath the button to access, it was not noticed in each case, and when prompted to view, it was felt there was too much text and could benefit from the addition of colour and images.

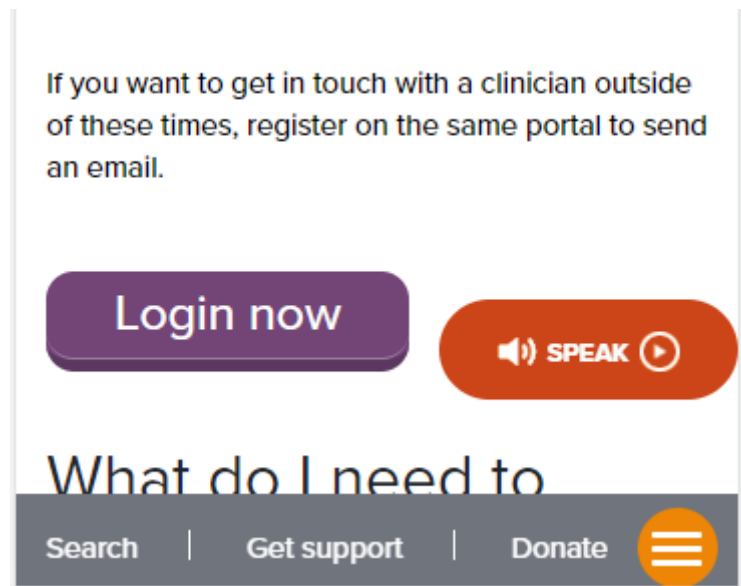


Image 2: Login button with FAQ not fully viewable on small screen beneath

The Live Chat tool sits on another site, accessible through a button this page. Call to action terminology such as 'Login now', 'Register' and 'Live' itself all create certain expectations and where all terms are used together, as they are on this page created much confusion.

“Do I login to register, or is registration separate? Do I login to make an appointment if it’s not open all the time?” Helen’s group

Findability/Usability: Site search

Site search would generally be considered a part of how a user navigates their way through a site, but there was a great discussion around this with a number of participants (n=5) and so came out as a themes of its own.

There is a site wide search available on the homepage that was a welcome feature across all participants, despite being acknowledged they would not always be inclined to use a general search but positive to see it there. Nearly half (four participants) would actively use search but potentially after “having a look around first” said one young woman 23 years-old. It was also stated that to use a site search one would need to know or expect that what they searched for was there, as in they would only make a few attempts to find something and if it didn’t yield results of interest they would more than likely leave the site. The number of attempts made would be different depending on what was going on for the user.

It was also acknowledged that there would be circumstances whereby users would not land on the homepage but an inner page via a search engine. Therefore, the visibility of the site search throughout the site is a key requirement.

Findability/Usability: Search terms

“The third paragraph on the “I’m not sure if I am depressed, sounds like exactly like what is going on for Meabh” Meabh group

In the case of Helen’s scenario there was disagreement amongst participants as to the approach of how she would move through the site, whether she would seek a channel to talk to someone first or seek information first.

Using the search for Helen’s scenario had differing results, the term ‘can’t eat’ delivered articles such as “Lockdown affecting eating habits” and the content within the article was considered to be similar to what was going on for Helen, but potentially slightly different.

Whereas the term ‘nauseous and can’t eat’ delivered no results and came back with a pages saying there are ‘0’ results for your search term, with no alternate links.

Findability/Usability: Triggers

Deeper into the site within the Information and support section there are topic clusters with buttons to access all content grouped by subject category e.g. anxiety, anger, bullying, feeling down etc. as shown in Image 3. Some of the participants found these useful as prompts and felt that it would be a benefit to host these on the homepage along with the open site wide search. While also acting as prompts, it was felt that even if a user did not access content this way it still gives a flavour of how deep the site goes in terms of content.

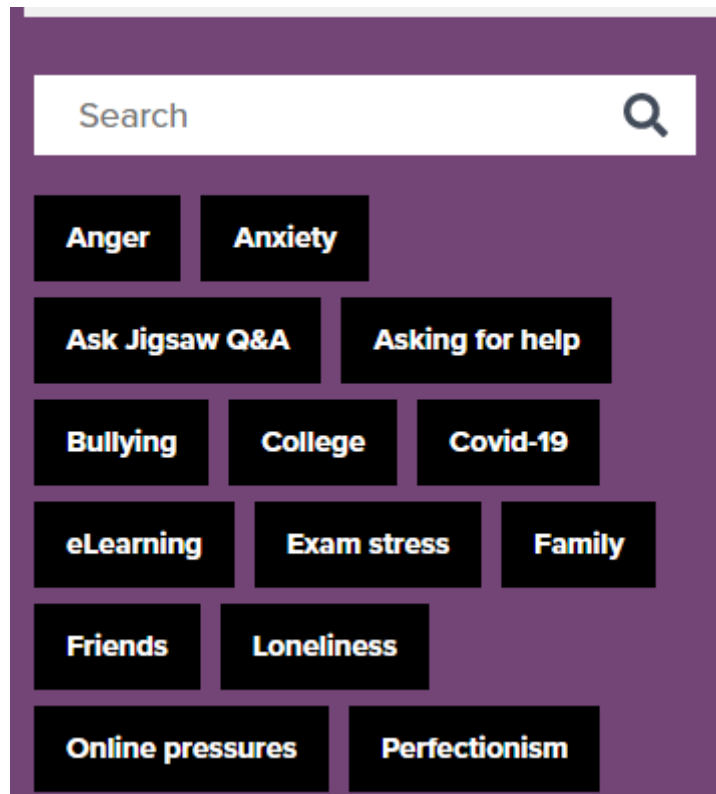


Image 3: Content theme buttons on inner page of site

Seeing content themes or menu item labels that resonates with the user is validating and reassuring, but when not visible has the opposite effect.

**“When you see a list of items and your issue isn’t there,
it makes you feel as if what you’re experiencing isn’t normal” Meabh’s group**

Site search delivering no alternatives when there was no exact match was a great frustration, creating a dead end for the user.

[Accessibility: access to features](#)

An online feature for synchronous clinical support on jigsaw.ie is the previously mentioned Live Chat. In three of the scenarios worked through in three of the workshops, the desire to talk to someone about what was going on was expressed as a potential goal for that user.

There are multiple ways to access this, through a button on the homepage, via ‘Get support’ horizontal menu, the primary navigation, and on different articles as hyperlinks within body

text. The poor visibility of menus, meant beyond the homepage it was difficult for some participants to access.

“Oh I’ve just seen it, the link to Live Chat underneath ‘Talk to someone’ maybe if that was at the top of the article so he could decide whether to do that or read on” Micheal’s group

In three of the workshops a number of participants accessed the Live Chat page, this function is currently only open on weekday afternoons. Discussion around the title ‘Live’ pared with a ‘Login now’ button gave the impression of being available on demand at anytime of the day, which is not the case. There was a slight expectation of a 24 hour access but that it would be staffed at specific points. In one of the workshops chat bots were discussed as being a solution to deliver some type of response for when there were no staff available. There was an expectation of some type of solution like this to overcome the limited opening times as considered so commonplace on other websites.

The ‘login now’ button links to a new portal that requires registration, where a username and email is required, followed by a questionnaire with a number of demographic type questions and previous help-seeking. This process was deemed to be prohibitive, in the initial stages of the three workshops where this was accessed.

Within the FAQ it claims that use of the chat platform is anonymous and so the need for registration came into question and was felt the two were in conflict with each other.

[Accessibility: features and tools](#)

There is an additional accessibility feature that sits over the site on all screens that welcomed by a number of participants (n=3) but despite not actually being used, was still valued and noted as being present. The way it sits over the site did interfere with some scrolling and buttons to other features, which is unfortunate blocker as shown in Image 4.

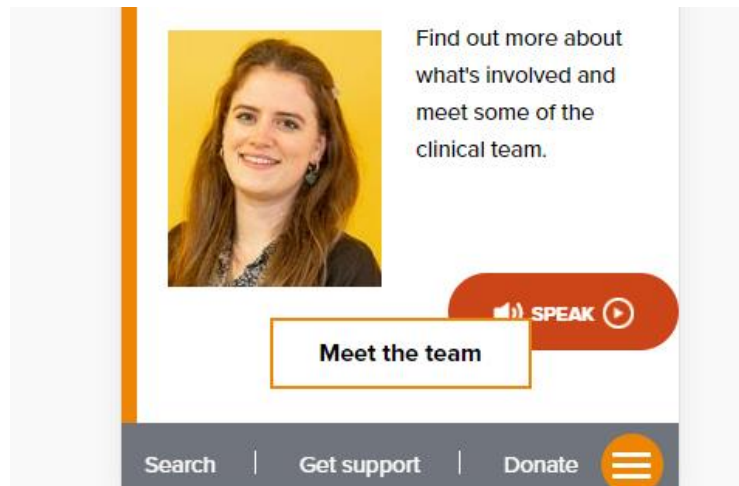


Image 4: Accessibility tool running behind onscreen button

There was no way to tell if any of the participants experience any visibility or physical impairments but discussion around accessibility features highlight an awareness of inclusive design. Yet it was clear, as previously mentioned, that the use of grey for menus created visibility issues and stronger contrast would be needed.

“There are so many videos that don’t have subtitles and that doesn’t sit right with me”

Stephen’s group

Accessibility: Content, language and layout

Overall, each participant found the overall look and feel to be inviting and engaging and gave the distinct impression that this was a space of support for young people and not “too clinical” compared to other search engine results for the same scenarios. There was a preference from some of the participants (n=2) for more diverse imagery, to represent many more different types of young people.

It was felt the language used was accessible, reassuring, clear and comprehensive while not alarming or too medical. While the imagery used resonated with the audience, more would be welcome with the addition of a lot more graphics and multimedia content to lessen the amount of text.

Breaking things down for clear layout and use of bullet points were valued, particularly when there’s ‘a lot of text’ but the content was considered “really helpful”. Some

participants (n=2) felt that there was inconsistent formatting which was confusing, and could not determine the hierarchy of information on an article page.

“...’asking for help from friends family can be tough however it's important step to make you feel better’ and I think that's what she needs to hear” (Helen’s group)

The layout of the Live Chat page where the aim is to strip away unnecessary design elements to keep the functionality clear as outlined in Nielsen’s 10 Usability Heuristics for User Interface Design. It was noted that this was quite plain compared to the rest of the site with be a preference for more imagery, graphics or multimedia to inform the user of the terms, and was felt the accordion hid important content.

Tailored content: moving away from the universal approach

A feature ‘Ask Jigsaw’, that provides asynchronous clinical support through a web form facility: questions are submitted through the site for a response by Jigsaw clinician. Both questions, along with the clinician responses are published together on the website as individual articles. The form itself was not necessarily that appealing to participants, but the articles from previous questions proved to be an effective content type.

The user-generated queries are published for the most part unfiltered and in the user’s own language and this resonated with participants. They were also attracted to the personalised responses given in these articles provided. In two of the workshops though, where the query was slightly different for a persona it became a bit of a frustration as unsuitable.

“It’s similar but possibly a bit too broad about lockdown affecting eating habits, and she’s not ready to read about eating disorders.” Helen’s group

A need for further options and mechanisms to access more refined or tailored content was expressed in these cases (n=7)

Headings that were clear and related to things that may seemed personal, like queries a user would have such as “Am I feeling low or am I depressed?” were well received.

There was clear and explicitly expressed disappointment with support in the form of advice that was considered too general and was felt that it could be the same as anywhere, expecting better from Jigsaw. One group working with the information-seeking persona who felt tired all the time expressed particularly distaste and jadedness for mentions of mindfulness and claimed they were all tired of having it presented as a “cure-all”.

The 'go for a run' and 'eat well' advice was disappointing when viewed and there was quite a lively discussion ($n=3$) around the impact of ineffective and helpful this type of advice, particularly when feeling distress.

Trust and awareness of credible sources

In each session with young people, awareness and distrust of unknown sources came up early into the activities when looking to access help online generally. Most participants talked of being very cautious of results one would get from general search relating to their scenarios, or general health or mental health concerns and how easy it is to "lost down a rabbit hole" of medicalised symptoms and self-diagnosis and the need to get support from a "reliable source".

General searches on Google, conducted on incognito screens, based on the proposed scenarios lead to words such as 'feeling down', 'tired', 'anxiety', 'can't eat' and 'no one to talk to'. The results served by Google were thought to be "not reassuring" and in some cases, "very medical and kind of alarming" (Meabh's group). Many were also from unknown and unrecognised sources and assumed to be American or British and therefore not relevant.

How sources are verified and proven to be trustworthy by the participants or deemed credible was unclear, and when pushed a lot seemed to down to recognition and endorsement from certain logos and strong use of strong meta-data was valued. In discussions about trust, there were inferences about look and feel of clear branding and seeing who was behind an online tool or publication, but this was very surface level. This cohort didn't look for an evidence base but the mention of clinical staff and their disciplines and a known name, with good metadata was reassuring. The mention of clinical disciplines was as a positive was alongside an explicit mention of a presence of content that was not 'too clinical' ($n=3$).

This group of young people who took part in the study have a pre-existing relationship with Jigsaw and so difficult to synthesise no knowledge from the outside for the sake of the research.

There was no notable different reported between iphone and android phones with alternate screen sizes.

Results of UES (sf) scale

Overall, the sum of scores for engagement using the UES were high in all areas: focused attention, perceived usability, aesthetic appeal and reward. Compared to the longer version of the UES, the short form has 12 items (outlined in Appendix E), with three questions for each factor and so produces even scores. For the factor perceived usability reverse scoring is applied to the results.

Table 2: First survey results - taken at end of workshop

Factor	Sum	Mean	Cronbach alpha
Focused attention	101	2.71	.6308
Perceived usability	109	4.03	.0789
Aesthetic appeal	113	4.02	.8625
Reward	122	4.52	.2087

There was little difference of significance comparing the sum scores of the survey at two different time points. However, the Cronbach's alpha, run a number of times showed very low reliability in scores for perceived usability and reward with the first survey taken at the end of the workshop. Results for perceived usability were tested both with reverse scoring and as they came.

Table 3: Second survey results - taken one day later

Factor	Sum	Mean	Cronbach alpha
Focused attention	100	3.71	.5769
Perceived usability	108	4.00	.7936
Aesthetic appeal	110	4.03	.8596
Reward	118	4.36	.7979

Holder et. al 2020 had found low reliability in the perceived usability subscale results using the long 31 item questionnaire, despite removing six items.

Discussion

Many of the themes that arose during the actual workshops are consistent with the evidence found in many evaluations of websites and apps, highlighting areas that need continuous work with users to come up with solutions that suit this target audience of young people.

Moving away from the universal approach

While credible sources were important and there was a clear awareness that a general search engine search could lead a user in the direction of non-trustworthy sites with unsuitable content how a source would be verified was unclear and there was no set way to do this. In discussions about trust, there were inferences about look and feel of clear branding and seeing who was behind an online tool or publication, but this was very surface level.

Moving away from the universal approach

Many studies have reported the need for more personalisation in help-seeking content (Pretorius 2019) yet this remains a challenge for mental health providers as the note the development of content separately from the technology often is not using the digital space to its full advantage (Lyon 2020). This cohort of young people had a previous relationship with Jigsaw but the discussion around recognition of a name and awareness highlighting the importance of brand awareness and effective metadata, displaying expertise.

Ease of use: Navigation and location

The poor visibility of the menus, due to colours and location, such as shades of grey together, lead the horizontal menu being unseen. The placement of the hamburger menu in an area that is inconsistent and goes against the convention of many other sites creates difficulties with general movement (Allison et. al 2019; UXmatters 2012; Reason 2016; Nielsen 2020). This greatly hinders an effective journey when a user lands on an inner page via search engine search, therefore demanding more onscreen navigation for users to move through the site, and requiring all pages to have inner links, or graphics to highlight key features, such as Live Chat. All of which presents greater challenges for design (Nan and

Kong 2016) on a smaller screens to highlight other features. Although there are a number of different types of help available such as self-help information, in-person details and online clinical support accessible avenues to make an informed choices was not clear to some users.

Using in the User Engagement Scale (sf)

There was little change of any significance in the sum of the survey results from the two different time points.

The favourable results in response to the sum of the survey results would seem to be at odds with some of the blockers that came up when attempting to fulfil their personas goals and therefore a questionable measure to rely on for this purpose. Cronbach's alpha also showed low reliability across the three of the factors in the first instance but this could have been due to the small sample size. It would therefore not be an appropriate measure to use in isolation to evaluate a mental health website but one of many tools that can be used as highlighted by findings by Holdener et al (2020).

The one consistently reliable score across the two surveys was the aesthetic appeal, which did in the focus groups, seem to be important to participants and they did find the site an attractive space.

Limitations

Conducting usability and UX studies in this way, with individuals on their phones, self-reporting while they travel through a website over Zoom presents a number of challenges. Often studies in this way as noted by Nan and Kong (2016) are held on desktop to provide a clear path for observation by the researcher, but this does not give an accurate snapshot of a user journey on a phone which was the aim of this study. Having to conduct the study over Zoom eliminated the ability to watch real-time behaviour such as hesitation or scrolling past buttons, navigation and features could be queried by the researcher and therefore relied on self-reporting and forced prompts.

The recruitment channel for young people may have skewed the type of young person taking part. A potentially broader sample acquired through different recruitment methods may have presented alternative findings. While all participants fully understood the

objectives of the study and the site itself, the relationship with Jigsaw created certain expectations that may not be taken for grant in real life scenario. A different cohort of young people with a lower level of mental health knowledge made have yielded different results.

Further research

At times with some participants (n=4) it was difficult to get consensus as to how their persona would proceed. Time pressure and the modality of delivery of the workshop over Zoom certainly added to this, and do conduct a similar study in this way it would be preferable to host one to one sessions, using the same person over a number of workshop.

The first UES survey results showed low reliability. This could be due to the small sample size, but could also show that after a period of time might be the better time assess engagement when using a scale like the UES. This would require further research and testing.

Conclusion

While it is clear that overall look, feel and content are important fundamental issues with usability could alter a users' experience which may not be identified quantifiably. In this study, aesthetic appeal did seem to have a strong influence of perception of the site, even in cases where it findability and ease of use were in question.

Meeting with real users to evaluate a mental health website is a crucial step in understanding context of use, motivation and usability and user experience of a website. Reliance on one method, such as User Engagement Scale (UES sf) or a similar scale, and online metrics would give a misleading impression of the usability performance of certain key features of the site.

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Appendix A. Persona 1 Meave,

21 lives in Dublin

- lives with her family; both parents and two sisters in suburbs of Dublin
- currently single
- studying history and English in Trinity
- Meave has experienced a number of 'lows' in the past but has never seen her GP or another health professional about this.



Interests and values:

Interested in the arts and enjoys visiting the theatre with friends.

A very private person, she shares her concerns with her closest friends.

Not close with either of her sisters.

She is aware that comes from a fairly privileged background and likes volunteering or 'giving back' when she can.

Happiest when she's reading/studying, she enjoys spending time on her own.

Tech use:

- Owns a laptop, tablet and smartphone.
- Uses her laptop for study and Netflix.
- Actively reads Reddit forums and Twitter but doesn't post.
- Listens to history and some film review podcasts on the bus to college.
-

Future goals

- Maeve hopes that a research PHD is in her future and wants a career in academia. It's very competitive for the type of posts she wants. She wants to take better care of her wellbeing, both physically and mentally, and hopes to achieve more of a balance after college.
-

Scenario

- Maeve has been feeling low for the past few days. There are a few things going on but she can't pinpoint the reason. She is really tired all the time and finding it hard to concentrate. Right now, she's just after information and doesn't want to engage with another person to help.

Appendix B. Persona 2 Micheal, 19 lives in Kildare

- Lives at home in a small town in Kildare
- Has been a father since he was 16, doesn't live with his child or girlfriend
- Just started engineering course, long commute to it
- Very close with his parents



Interests and values:

Really enjoying his course. Loves playing sport, GAA or soccer but now with college, the commute and seeing his girlfriend and child this has had to sit on the back burner for awhile and he's finding all this very hard. Things with his girlfriend are strained but he wants to see his child as much as he can. His parents are a huge support to him and girlfriend, although they don't live with them, they do a lot of taking care of the child.

Tech use:

- On his smartphone all the time, particularly on his commute
- Passively on a number of social media websites watching, reading and browsing but never posting
- Reads sports sites and listens to sport podcasts
- Recently got laptop for college but didn't use computers much before

Future goals

- Wants to graduate from college and get a good job. Wants to be a good provider and role model for his kid. It feels very far off and unrealistic but he didn't think he would get in to college and here he is. He would love to get back to playing sport.

Scenario

Micheal is feeling really overwhelmed by the workload at college and is feeling extremely stressed about the upcoming exams. Things are strained with his girlfriend as well. He doesn't want to worry his family; feels too uncomfortable to open up to his friends. On his commute seems the only really private time he has. He wants to talk to someone but not someone who knows him and doesn't want to raise any flags at college.

Appendix C Persona 3: Stephen

22 lives in Galway

- lives in a house share in Galway
- didn't go to college, worked in retail after school until recently taught himself how to become a videographer has just gone freelance
- earning quite a bit of money for the first time
- single
- experienced anxiety quite a bit since he was about 13/14
- has been to face-to-face therapy, when he was doing his leaving cert
- has wide strong support network in his friends that he lives with and some from school.



Interests and values:

Really values his friendships and is very loyal. Likes the outdoors and spends as much time as he can; surfing, hiking or camping. This is gotten him a lot of work as he experiments with videography during these pursuits and lots of activity agencies aimed at this kind of tourism just outside of Galway are commissioning him.

Tech use:

- High spec laptop and cameras for work
- Very active on Instagram, Snapchat and Twitter, socially and proving good for work
- Watches Youtube
- Plays online games through a Playstation the odd time in the main communal area of the house.

Future goals

Work start and grow the It was before. Maybe he gets to start a collective or his own small agency.

Scenario

Although things are going really well recently, he has started to recognise signs of heading for one of his anxiety or low spells. He feels it's a bit unfair that he should be feeling like this as things have really come together and he's not sure why. What he not acknowledging is that he has been burning the candle at both ends and not taking time out which is taking its toll.

Appendix D. Persona 4. Helen 23.

- lives with two flat mates in Dublin City
- dropped out of college in second year
- works in an IT company at entry level role with salary that disappears into rent and a few nights out a month
- with her boyfriend six months
- has felt low a lot a different points in her life and was diagnosed with depression at 19. Doesn't really click with her doctor though.

Interests and values:

Social, goes out a bit but few close friends although many acquaintances.

Finds it easy to make acquaintances but harder to turn them into close friends.

Not close to her family.

Values privacy and shares very little about her history with those around her

Doesn't share that much with her boyfriend, still feels things are early.

It's not unusual for her not to share with close or boyfriend, often feels that people 'don't get her' and never did.

Tech use

Smartphone but no laptop or tablet.

Very active on Instagram and Snapchat

Watches Netflix with her boyfriend on big TV, but other than that doesn't watch TV.

Future goals

Wants to travel, anywhere. To leave Ireland is the main goal. Worried about where to start and having enough money to do it.

Scenario 3

Helen is struggling to sleep, can't eat and feel nauseas all the time recently. She's managing to keep up with work and socially. Her boyfriend has asked is there something up but she has brushed it off. When she's at home on her own it can get a bit much. She wants to fix it and now. Tonight she reaches for her phone and hopes to find some help online that will help her right now.

[Appendix E : User engagement scale short form](#)

Questionnaire items and instructions for scoring

FA-S.1 I lost myself in this experience.

FA-S.2 The time I spent using Application X just slipped away.

FA-S.3 I was absorbed in this experience.

PU-S.1 I felt frustrated while using this Application X .

PU-S.2 I found this Application X confusing to use.

PU-S.3 Using this Application X was taxing.

AE-S.1 This Application X was attractive.

AE-S.2 This Application X was aesthetically appealing.

AE-S.3 This Application X appealed to my senses.

RW-S.1 Using Application X was worthwhile.

RW-S.2 My experience was rewarding.

RW-S.3 I felt interested in this experience.

B1. Scoring the UES-SF

- Reverse code the following items: PU-S1, PU-S2, PU-S3.
- If participants have completed the UES more than once as part of the same experiment, calculate separate scores for each iteration. This will enable the researcher to compare engagement within participants and between tasks/iterations.
- Scores for each of the four subscales can be calculated by adding the values of responses for the three items contained in each subscale and dividing by three. For example, "Aesthetic Appeal " would be calculated by adding AE-S1, AE-S2, and AE-S3 and dividing by three.
- An overall engagement score can be calculated by adding all of the items together and dividing by twelve.