

Developing design criteria for iPad stands to meet the needs of older adults in group settings

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Abstract

This paper details the evaluation process undertaken to create criteria for the development of an iPad stand for elderly users. Emphasis is on the requirements elicitation stage with end users in the field. 32 elderly participants taking part in the activity group as part of the Ageing-Well program of a City Council in a cosmopolitan area in Australia were part of an evaluation in which three existing iPad stands were trialled. While commercially available stands are abundant, specific problems such as reduced grip, basic technical understanding of the stand, and concerns surrounding stability were encountered within the group. Observation and semi-structured interviews were undertaken with the cohort to determine factors surrounding the suitability and uptake of these stands by elderly users – most of them with some disabilities - with findings suggesting that current tablet stands require fine levels of dexterity, which may not be appropriate for elderly users where such a device is needed. While usability in setting up the stand and use is a strong factor, aesthetics and material qualities are equally important for enjoyable use. In addition, the use of iPads in social activities between two or more older adults has specific demands in terms of visibility of screen, sturdiness and easy movement that is not considered by current tablet stands. The paper ends with proposing design recommendations. Further research is required to develop a suitable solution and refines these.

Keywords: iPad stand, co-design, older adults, usability evaluation, design aesthetics, case study

The research undertaken within this paper was part of a larger research project investigating mobile touch screen technology use in activity groups for older adults. We collaborated with a local council that is offering activity groups as part of their ageing-well program. Through this initiative, the council procured twelve iPads. While the primary focus of the research was an app development that is engaging for this target audience (refer to Pedell et al, 2013), the council staff was also interested with how to introduce, train and integrate the iPads into their group activities. In order to provide these groups with a useful experience and limit fatigue from using the product in a social setting (holding up the iPad for everyone to see the screen), tablet (iPad) stands are required. This holistic view is in accordance with other research which suggests that for the successful introduction of technology in older users' life, it is not only the technology, but also the whole socio-technical system that needs to be designed and

considered (Waycott et al., 2012). In this case, this includes the social setting as crucial part of technology use in elderly activity groups (Pedell et al., 2013) and a suitable tablet stand.

Human factors, synonymously to Ergonomics (Sanders and McCormick, 1993) focuses on “human beings and their interactions with products, equipment, facilities, procedures, and environments used in work and everyday living. [...] Human factors, then, seeks to change the things to better match the capabilities, limitations and needs of people” (p.4). Here, we aim to collect information on capabilities, limitations and needs in a field study with older adults in order to ensure realism and generalisability. Observations and evaluation are crucial methods in the design process for the creation of more usable interactive products (Rogers et al, 2015).

Literature Review

Usability in older adults' technology use

Technology use in older adults is rising each year (ACMA, 2016) however, the design of technology and in particular mobile devices is centred towards able-bodied, young users. Technology, such as the iPad can promote social inclusion via applications such as video-conferencing, for example Skype, and increasingly, older adults are using social media websites such as Facebook as a way of keeping in touch with their families (ABC, 2017).

According to Allenby's study, (as cited in McMurtrey, 2003), any new technology designed for an older person needs careful attention paid to the design of the display screen, choice of input device and the design of instructional materials and technical support systems such as help functions. Age-related changes in basic human abilities need to be acknowledged to ensure that the usability of the technology fits the capabilities of the user (Charness, 2009). These changes include the perceptual, cognitive, and motor systems of an older person (Fisk et al., 2009). In fact, according to Mallenius (2007), design should not be focused on age, but functional capacity. Considerations include decreased colour perception, difficulty hearing high-pitched sounds, decreased memory capacity and increased difficulty with fine motor skills. With these constraints in mind, designers can create better digital products for older people.

Specifically, this research project was designed to utilise the iPad to promote interaction within the council-run social activity group. One hindrance to the uptake of iPads that was found in this group was the perceived fragility of the device, due to its thin glass screen and aluminium casing and group participants' hesitation to hold them or problems to hold them and use them at the same time.

There has been a lot of interest in recent research in the use of iPads for an ageing population. Advantages of touch screen tablets have been discussed by Caprani and colleagues (2011). Main benefits include (i) ease of use, (ii) mobility of the device, (iii) weight and (iv) flexibility in regards to individual interests (Simons and Kimberley, 2015; Hillier, 2013).

There had been not much research on the use of stands beyond product reviews (e.g. Fingal, 2013; Thiele, 2013) and to our knowledge no study has been conducted in which tablet stands are investigated on how use by groups of older adults can be supported by appropriate stands. While this is a lack for any user, it is particularly important for an ageing population. Even

though good stands are not tied to age (Hedge, 2013), age can be a variable that makes use harder (e.g. low vision, arthritis leading to less mobile fingers) for this user group. While such considerations are important, we do not want to fall in the trap of designing focussing on health deficit of the ageing population only. Pullin (2009) points out that designing with a deficit model in mind leads to design that can be stigmatising.

Aesthetics

Literature in the field suggests that the uptake of assistive devices can be hindered due to the aesthetics (Yeh, 2009); as the iPad has a very strong and iconic design aesthetic, the design of the stand should complement this and not take on the appearance of being something “*assistive*”. Ergonomics, as well as aesthetics should be considered in product design (Nunes, 2006). For example, the current homogeneity of wheelchairs is driven by ergonomic needs for people forced to be in a sitting position all day to support their spine. The similar look of wheelchairs results in a cover up of any individuality of their users (Barber, 1996). Similarly, developers of technology suitable for older adults put age first and ignore the diversity of this large and varied user group (Durrick et al., 2013). The majority of design surrounding ICTs for elderly users focuses on declining health, failing to provide appropriately designed technology and accessories to capable users or over-emphasising health issues. Design following a deficit model can often appear patronising to the user, where aesthetics are unattractive and stigmatise the users as incapable. Ideals of beauty and engaging use that are relevant to the ‘non-aged’ consumers are also relevant to the older users. Hekkert & Desmet (2007) propose all sensorial experience informs aesthetics and thus we include the material, tactile qualities surrounding product use in our investigation.

We are not denying that older adults often do have physical constraints that prevent them in using certain products. However, what is proposed here is that this should not be the focus or the end result of the design to meet these limitations, as this often results in feelings and perceptions of stigma and consequently in non-use.

The objective is to provide an ergonomic iPad stand in the spirit of inclusive design that is aesthetically pleasing and at the same time caters for a range of capabilities, age and interests with a particular focus on how the stand can be used in group settings. While we speak in this paper of older users, the defining characteristic that drives our design and development is that it needs to be appealing to this wide range of capabilities, interests and ages as can be found in existing ageing-well groups.

In order to explore and understand user needs a study including a range of methods such as observations and group interviews was conducted. We aimed to find out what makes an iPad stand usable what aesthetic characteristics contribute to a positive user experience and how can materials support such an experience.

Context of the study

As part of a larger project in table technology uptake a suite of applications such as quizzes and games were installed on iPads, alongside custom applications that were developed for and catered to the specific demographic of the user group (see Pedell et al, 2013). However, within

the implementation of the technology, it was found that an inhibiting factor of the uptake was due to the viewing angle, weight and physical orientation of the iPads. Many of the participants were affected by physical constraints such as using one arm due to stroke, immobility and reduced strength in wrists and fingers and limited eyesight. Literature that involves studies relating to viewing angles of computer screens and interfaces (e.g. Hou et al., 2012) suggests that viewing angles are highly relevant for good user experience (Bellman et al., 2009) and health in order to avoid neck problems (Torsheim et al., 2010), but focusses on single and often younger users (Myrtveit et al., 2014; Torsheim et al., 2010). Hence we conducted this study to find out about what makes a good tablet stand for older adults in a group setting to overcome these challenges.

Research Methods

Three commercially available stands were procured and tested with the group of older adults in the council.

Procedure and participant sample

The trial involved 32 older adults participating in an activity group. Five researchers sat with five groups of six to eight participants overseeing the activities and data collection. Larger groups were seen as impractical as some participants had vision and/or hearing problems. Staff members were assigned to individual groups to assist and encourage participation. Besides one that had used and owned an iPad, the rest of the participants had no experience. They were over 65 years old with the majority falling in the 70 to 85 year old bracket. We used a mixed methods approach of semi- structure interviews and observations over the period of ten weeks. The research team was visiting the group once a week for two hours. Initially, an observation into the general physical abilities of older adults in the council activity groups in setting up the stand was conducted. Then we explored how existing stands were used, were perceived and allowed social interactions while using iPad applications. Lastly this was followed by deriving implications for the development of a stand for different co-located activity group settings.

Chosen iPad Stands

In total three iPad stands were procured for evaluation with our participants. Observations in former research have established that the standard Apple smart cover is not usable for older adults (unpublished report by authors). The stand is difficult to set up and does not provide sufficient stability during use (see Figure 1). The screen reflects so that it is hard for more than one person to see the content on the screen.



Figure 1. Apple smart cover during set up and in use

From the vast amount of commercially available stands, the researchers chose three. They appeared promising in their feature set to be intuitive in their use for older adults and provide a high level of stability. We trialled three existing iPad stands: (1) Belkin Flip Blade Adjust, (2) Wallee X-Lock Kick and (3) Joby Gorilla Mobile Yogi. The following sections describe the main features and in more detail our decisions to use these particular stands for evaluation and a starting point for developing an iPad stand specifically for older adults in a social setting. A brief discussion about the key features of each stand is found below.

The Belkin Flip Blade (Figure 2) is made of aluminium and plastic with a spring-loaded mechanism. It has an ultra-slim design, which folds into itself for storage. Its dimensions when folded are 10 x 9.5 x 14.5 cm (L x B x H) and weighs 181 grams. It has the ability to tilt approximately 270 degrees. Thus, providing users with four adjustable positions by pressing two buttons in unison with one hand and rotating the rear support with the other hand. The Belkin does not have adjustable viewing angle. Even though it supports both portrait and landscape modes.



Figure 2. Belkin Flip Blade Adjust.

The Wallee X-Lock Kick (Figure 3) consists of a stand and case combination, whereby an angled metal bracket is locked into the stand thus providing a rotation function to the user. The mount is made of brushed aluminium and plastic resin for the case. Its dimensions is 16.5 x 7 x 5 cm (H x W x D). This stand is able to support both portrait and landscape modes. The

stand weighs 136 grams and the case weighs 68 grams.



Figure 3. Wallee X-Lock Kick

The Joby Gorilla Mobile Yogi (Figure 4) is made of polycarbonate and ABS plastic. The case weighs 147 grams and legs weigh 111 grams. It is also a case and stand combination. It comes with a pair of two highly articulated legs that bend in three dimensions. Due to the flexibility of the legs, this stand is able to provide users with countless adjustable viewing angles in both portrait and landscape orientations.



Figure 4. Joby Gorilla Mobile Yogi

Data Collection

Data was gathered via observations and semi-structured interviews during the ten group sessions. These sessions were recorded with video cameras. This was done in the five “natural” groups that were focus group sized, comprising six to eight older adults. The observations were undertaken during various stages of setting up the stands and user interactions – as individuals and a group, while using different applications on the iPads. During the sessions, the researchers focussed on the interactions with participants while taking notes on their immediate observations and the feedback participants provided. After all visits, a detailed

video analysis was performed using usability and ergonomic criteria for this analysis (Bevan, 2001; Nielsen, 1993).

Usability of stand setup and use

This stage investigated the necessary capabilities to set up different iPad stands. The three stands were given to participants with no instructions on their use and were told to set them up with the iPads. Assistance was only given when participants ran into difficulties. The observations of interactions with these stands focussed on grip, adjustability and general ease of use. As older adults were in groups, other participants would “*throw in*” suggestions or discuss their theories on how the stands work. Overall, participants were keen to trial these stands and would be cheered and clapped when process was successful. Researchers made sure that this was well-integrated as an activity rather than a rigid usability lab session in order to not put users under undue pressure. Participants would pass around these stands when they have had enough or succeeded and did not feel being under performance pressure. This was not only important to ensure participants were comfortable but also to take note on how much time they would give to a trial in real conditions (Duay and Bryan, 2008).

Interview questions

Questions during the interview focused on the user experience specifically on perceived efficacy, aesthetics and comparative analysis between the various stand designs. Questions in regards to the efficacy of these stands included:

- “How do you expect it to work?”
- “What do you like about it?”
- “What don’t you like about it?”

Questions were also asked regarding the products’ perceived aesthetic qualities:

- “How does it look like to you?”
- “How do you like the colour?”
- “How do you like the size?”

Questions on material qualities

- “How do you like the material?”
- “How does the stand feel to you?”

Particular emphasis was put on material as according to as Hekkert & Desmet (2007) it is important to include all sensorial experiences when considering aesthetic qualities and material is crucial to the tactile experience.

Once all the stands were evaluated over several sessions, participants were asked how the different stands compared to each other during use. Questions asked were:

- “Which one of the stands would you like to use?”
- “Which one is the easiest to use?”
- “Which one do you like best to look at?”
- “Which one do you think will last the longest?”

- “Any ideas for a stand that would be better than any of these three?”

Interactions with these stands were evaluated through observations, with particular care given to document the “unconscious” movements by our participants, such as group members huddling together when a stand was in use, versus the more private, single usage sans stand.

Also some video was taken and analysed in detail across the five groups and all visits. Not the whole visit was videotaped, but only sections of the visit. Focus of this analysis was on how users interacted with the stand or the screen and what impact this would have on the stand such as stability.

Data analysis

The interviews were transcribed and the researchers analysed words, meanings, themes and ideas provided by participants. A number of techniques were employed to analyse the interview data and the observational notes. Frequency of words related to participants’ perception and use of the stand were manually extracted and grouped to create a mind map. This was further analysed with use of the content analysis method according to Patton (2015) and thematic analysis was applied (Guest et al., 2012). Similar ideas and themes were grouped with the use of affinity diagramming (Courage and Baxter, 2005).

Results and Discussion

Usability of set up of and use of stands

Most of the participants had one or more physical limitations. The most common ones included mobility problems such as requiring a walking frame or cane, arthritis in fingers, inability to use more than one hand due to stroke, vision and hearing problems. All these physical limitations have an impact when using mobile touch screen technology and setting up of a stand. The three stands are discussed below:

Table 1. Comparisons of three existing iPad stands commercially available.

Stands	Materials	Tilt	Modes
Belkin Flip Blade Adjust	Aluminium, plastic	4 angles	Portrait and landscape
Wallee X-Lock Kick	Brushed aluminium	2 angles	Portrait and landscape
Joby Gorilla Mobile Yogi	Polycarbonate, ABS plastic	Countless angles	Portrait and landscape

Belkin Flip Blade Adjust

One participant who had limited grip strength, remarked that this was “... *hard to use with one hand, strong press necessary.*” The stand’s mechanism was not as intuitive as the researchers initially thought ~~were~~. Even though participants watched each other operate this stand, some were unable to use it successfully. Several of these participants were only able to use one hand, due to various physical limitations, which increased the level of difficulties and subsequently leading to discomfort with this stand. However, overall it was well received when it was set up. One drawback of this particular product was that participants noted that there was a lack of adjustability in regards to the angle of iPad once it had been setup. Their

concerns were also around the main support piece: visually, it appeared too short for portrait orientation. Although, in reality, this stand is quite sturdy.



Figure 5. Testing Belkin Flip Blade Adjust stand with participants

The participants also expressed concerns with the quality of the mechanism, with one commenting that “... *It should be spring-loaded – then it would last longer!*” In regards to positioning the device in the stand, they were also concerned that the metal construction would scratch the shiny glass and aluminium surface of the iPad. However there is a layer of coating on the iPad that prevents scratches, although it is only found on one side. The other concern was that the iPad was very slim and it could slip out – several participants suggested that it should sit more sturdily within the stand (see Figure 5). In general, they felt that the unit should be one contiguous assembly where the iPad and stand were a single contraption so that it reduces the chances of misplacing either parts, “... *not that the iPad is in the kitchen and stand is in the bedroom.*”

Wallee X-Lock Kick

The Wallee addresses some of the main issues surrounding the Belkin stand; firstly the stand and case become one joined piece when assembled. There was a pre-defined list of angles and it looked to be a simple and easy to use product. However, it was the least desired out of the three tested. All participants as well as researchers and staff members realised that several difficulties presented themselves in the assembling process: (i) It was hard to figure out for the participants where to join the two pieces. One elderly lady expressed it this way: *Like this? [...] Like that? Too high! Too high? No. Maybe the other side. No? Is it still too high? So, maybe this way. Too high! I give up!* (ii) Even when the participants grasp conceptually how to assemble the two pieces several older adults got worried: *That way yeah? [...] Ooop’s Thats it? Like that? Oh I am frightened. And I don’t want to break anything that’s not mine.* A too high level of manual strength and dexterity were required in order to clip the stand into the case. In addition an older lady had poor vision and commented on the stand as follows: *No. It won’t...It’s like putting the*

tray thing in the microwave.

In order to attach the tablet to the stand, good eyesight was also necessary. Overall this stand proved to be a very difficult task for participants. It was very easy to make errors for most participants, alongside researchers, experiencing difficulties with assembling the product. When the stand was set up on a wrong angle, consequently, it would collapse during use what was experienced as even worse because users would get startled and were worried they had damaged the iPad. This stand also had the unwanted effect of scratching furniture. In two situations, (1) the supporting metal edge of stand was quite sharp and scratched the surface of a table even though it was hardly moved and (2) turning the stand toward another participant left a very prominent scratch mark; in the second case the user would not be able to lift the iPad as he had limited grip capabilities. When used with older adults limited grip strength or dexterity are common and a stand cannot be expected to be lifted. This particular stand could quickly lead to not only the furniture being damaged but even possibly causing injuries to the user. From a functionality point of view, participants did not find this stand to be as sturdy either as the Belkin when interacting with the screen.

In summary, the participants' level of interest in this stand noticeably diminished after numerous attempts to set it up – again due to many of the participants having either limited dexterity or the usage of only one hand. This product was quickly ruled out as a possible solution. Other limitations include non-adjustable viewing angle and not being foldable. Nevertheless, this stand gave us valuable insights into requirements for an iPad stand.

Joby Gorilla Mobile Yogi

With this stand, connecting the case to the legs was reasonably easy, but not without faults. Most of the participants attempted to slip the legs into the case, but would realise then that there was a small toggle to be pushed for the legs to be clipped into. Due to the small size of the toggle, those with limited dexterity or eyesight found it difficult to operate this quite delicate element: *I can't see it. [...] Like that? Where am I going? Like that? [...] I can't see it. Have no glasses on. Oh. I'm not strong enough. Is that it?* While it was easier to assemble than the previous stand some participants gave up or handed over to others: *What? The clasp [...] I can't do it. and Am I right that way? Oh. It won't go in. It's interesting.*

However, once it was set up, it rarely needed to be adjusted. Participants very much appreciated the stand's stability and ease of use in regards to changing the angles even when only resting on one of the two legs during use (see Figure 6). In order to switch the iPad into portrait mode, users were required to physically detached the legs and re-attach them to another position. This was as discussed prior – a quite difficult task to achieve, but participants would receive feedback via the “click” of the iPad snapping in when they had completed this successfully.

Overall the participants were unconcerned when using the stand. One main advantage was seen in that it was not necessary to take apart the stand and once it was set up as it joined to one piece. However, the stand was easier to fold and pack away when compared to the previous stand. Participants found that overall it was a very usable stand and displayed great comfort in handling it. This stand was also the easiest one to change position to show other people in the

group content on the screen or to hand over. Neither was there any danger of the iPad falling over, falling off the stand or scratching the furniture. Some of the participants enjoyed bending and playing with the legs. One lady was twisting it right up and using it as a pretend microphone. The playful aspect should not be underestimated and certainly added to a good user experience. The biggest discrepancy between interview data and observation data became apparent in what people said about this stand and the level of comfort in use they displayed. Some of the participants bent the legs around their own upper leg to use the iPad in her lap, but also to trial the grip of the legs in unusual positions. One participant was asked whether she was comfortable with the result responded: *Yeah. It's comfortable like that. Very comfortable. You just have to put it like that.* However another participant commented: *I got big fat knees and my belly is in the way. No, it's not comfortable.*

Overall, the Joby Gorilla Mobile Yogi was the most stable, easily to position and most versatile of the stands and handled the most competently by the participants. Unfortunately the manufacturer has since discontinued production of this stand.

Aesthetics

The most appropriate stand, the Joby Gorilla Mobile Yogi was deemed by the group to be unattractive and confusing to look at first. Aesthetically, this stand fared poorly as participants found that the uniquely shaped legs (which allow the stand to be positioned in a myriad of ways) to be unattractive or at the least very unusual. Hence the first reaction of many participants when looking at the stand was negative. This is interesting as other stands did neither receive a spontaneous positive response nor any negative response. This can attributed to the 'Most Advanced, Yet Acceptable' design principle popularised by Raymond Lowey (as referenced by Hekkert, 2006), where the design of the stand may be too far removed from the archetype, leaving the user uncomfortable with its aesthetic treatment and functionality.

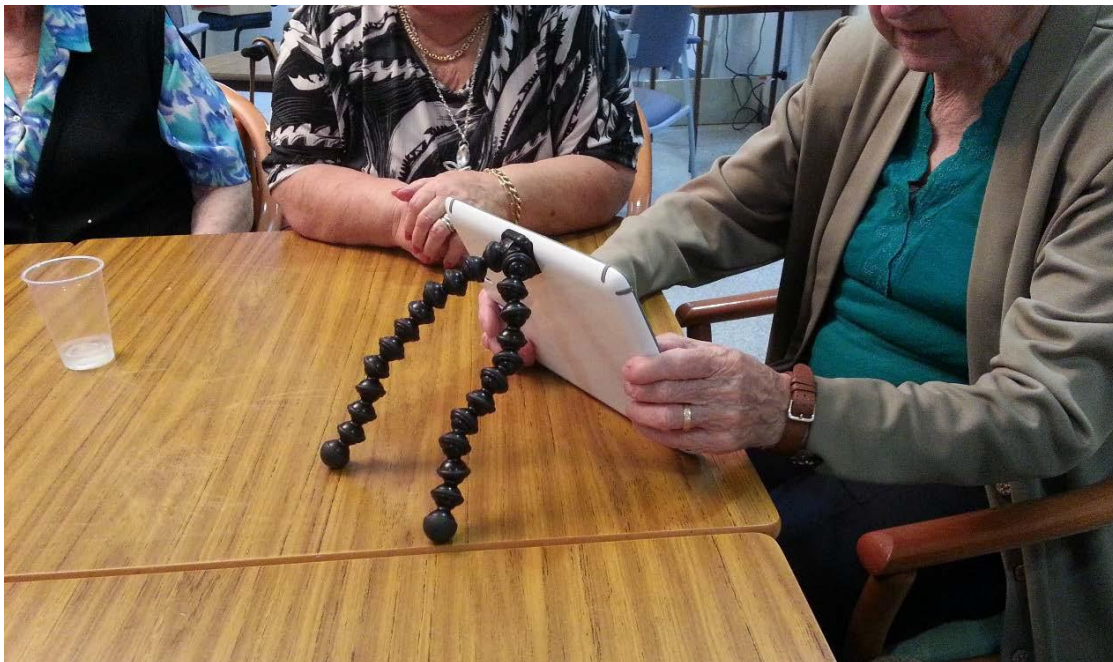


Figure 6. Testing the Joby Gorilla Mobile Yogi stand with users

Materiality

The group was also asked about their personal preferences regarding materials and weight of these three products and what they would like to see. Weight was a big issue in regards to the stands due to physical limitations of our participants. Hence a good grip was considered to be important. One participant felt that "... an iPad stand should be "light, not slippery", with other participants (male group) feeling that it should be more about "... *weight balance that makes them like a good tool.*"

In regards to materiality, most appreciated the plastic covering as it inferred a level of protection and impact resistance to the iPad. Many participants liked the leather Apple "Magic Covers" of the researchers' iPads, however they remarked that the angle was too shallow to be usable and that the magnetic locators were too fiddly and in one case it ripped off and fell. Hence, it was not chosen to be included in the formal evaluation from the start. The results were taken into account to propose a first set of recommendations for creating a usable and enjoyable iPad stand for older adults in social group settings.

Implications of results

A selection of stands was trialled with a group of older adults which despite being considered promising by the researchers originally showed minimal success when tested in the field with a real ageing-well group of older adults participating in a council program. Hence the findings suggest a new tablet stand to cater specifically for older adults in a social group setting is needed. The following recommendations are formulated around set up and use, aesthetics and material of a future stand:

Usability of set up:

- 1) The stand should be easy to assemble by older adults with varying physical capabilities including poor eyesight, single hand use and limited dexterity.
- 2) The tablet and the stand should compile to what behaves in use as one unit to avoid sliding, wobbling and disintegrating
- 3) There should be clear indicators via feedback (visual and acoustic) when the stand and tablet are securely assembled

Group use

- 4) The stand needs to be very sturdy during the interaction of one or more users in particular to strong pressure against the screen
- 5) The position of the screen angle needs to be adjustable to increase visibility for two plus users.
- 6) The tablet on the stand needs to turn easily without losing stability to be able to hand over the tablet for interaction to another group member

Aesthetics

- 7) Aesthetics is relevant and the look should carry a certain familiarity for the user Materials
- 8) The materials of the stand should support a good grip
- 9) It should be constructed from a light material

These recommendations need to be detailed further in future studies. In particular in regards to aesthetics we merely received comments in regards to what people did not like in look.

Conclusion

This investigation highlighted the need for an appropriately designed and marketed tablet stand for older adults with varying physical capabilities in a group setting. As this study grew from a problem with researchers' initial investigation – i.e. uptake of technology with older adults – it is apparent that for this demographic to engage successfully with such products, there must be considerations into the physical engagement and interactions with these products in use. While there are a myriad of stands available for iPads and other tablets, the problem is that none have been designed specifically for an older user demographic.

The evaluation showed that none of the three iPad stands were ideal for the use of older adults in the investigated setting. This emphasises the necessity to further research the needs and attitudes of the elderly as well as what appeals to them in order to create appropriate solutions. First recommendations have been formulated to create an iPad stand which addresses the physical, but also the needs of older adults when using iPads in a group. Aesthetic and material needs require further research. Future research will create an iPad stand based on these recommendations which is regarded as preliminary high level guidelines for development. In a design process we will create the stand together with this group of older adults and will refine these recommendations in more detail to come up with formal guidelines.

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Authors Biographies

Sonja Pedell

Sonja Pedell is Director of Swinburne's Future Self and Design Living Lab, where her research contributes extensive knowledge of human-computer interaction (HCI) and research methods to the teaching of digital media and communication design. Alongside this role, Sonja is also Department Research Director for Swinburne's Department of Communication and Digital Media Design. Sonja's research interests include user-centred design methods, scenario-based and mobile design, domestic technology development, and the design of engaging novel technologies for various user groups, in particular for the ageing population. Sonja has received the Deans Award for Outstanding Researcher. She is the recipient of ARC, CRC and other grants. Prior to taking up these roles at Swinburne, Sonja completed a Masters of Psychology from the Technical University of Berlin and was employed as an Interaction Designer, Usability Consultant and Product Manager in industry for several years.

Jeanie Beh

Jeanie Beh graduated from Swinburne University of Technology with Bachelor and Master Degrees in Multimedia.. She is currently a PhD student in the Faculty of Health, Arts and Design at Swinburne University of Technology. Jeanie is passionately interested in overturning the perception that older adults are unable or disinterested in developing skills in using technology. Her research focuses on ways to engage older adults with mobile touch

screen technologies through the role of human interest. Jeanie works as a research assistant at Swinburne's Future Self and Design Living Lab. Currently, she is focusing on dementia related projects such as using technology to support social engagement while interacting with staff members, participants and their family members. When Jeanie is not doing research, she works as a freelance multimedia developer and designer. She has a year of experience teaching kids from prep to year 10 robotics and coding and almost seven years as a computer class tutor for older adults.

Gianni Renda

Gianni Renda is Deputy Director of the ARC Training Centre in Biodevices at Swinburne; an industry-linked and Government-funded PhD Training centre that focuses on industry transformation within the medical device industry. He is also a Senior Lecturer within the School of Design, focused on Industrial Design, Sexual Health and Assistive Technologies. He is heavily involved in community outreach in STEM education, mentoring groups of secondary schoolchildren in projects. Gianni holds a Bachelor of Industrial Design with Honours and Doctor of Philosophy from Swinburne University.

Emily Wright

Emily Wright lectures with the Design Factory Melbourne and the Communication Design Department at Swinburne. Her research focuses on human centered design, packaging design and design innovation. Her design practice career spans 20 years with work in publishing, branding, packaging and web design in the US, the UK, Mexico and Australia. Emily holds a Bachelor of Science from the University of Cincinnati and a Masters as well as PhD from Swinburne University.