

## Helping older adults conquer digital tablets

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*P. Wright. Helping older adults conquer digital tablets. Gerontechnology 2016;14(2):78-88; doi:10.4017/gt.2016.14.2.005.00* **Purpose** Three questions were asked about voluntary peer group meetings attended by older adults who wanted to improve their competence with digital tablets: What did people need to learn? Could interface changes reduce cognitive demands? Which elements of the meetings enhanced their success? **Method** From May 2013 adults aged 50+ belonging to a UK branch of the University of the Third Age met once a month. 76 people attended at least one meeting during a 27 month period. They were helped to use their tablets and interface design implications were noted. The elements within meetings (for instance, discussion, demonstration, practice, etc.) were modified as problems arose. **Results and Discussion** Average monthly attendance grew from 11 to 15 but 63% of the attendees dropped out after one or more meetings. Necessary learning included finger gestures, distributing attention, and multiple routes to similar goals. Complete beginners needed individual help before benefitting from the group. The important elements of meetings were consistent with cognitive learning theories: reducing distraction by increasing group homogeneity (separating iPad and Android users); including a projected demonstration of new procedures as an advanced organiser; aiding memory through a printed handout. Group cohesion was enhanced through discussion and by putting handouts on the group's web page so absentees could stay informed. **Conclusions** Digital tablets offer viable internet access for older adults but pose learning challenges that would be fewer if interface design better supported cognitive processes such as memory and attention. Within group meetings of older adults a balance between social and instructional activities enhances satisfaction.

**Keywords:** digital tablets, interface design, internet, peer support, computers

The benefits of continued learning in later life have been shown<sup>1,2</sup>. Adult learning differs from school learning in being much more self-directed<sup>3</sup>. Consequently adult learning is more successful when it maps onto the learner's personal goals and so can be seen to be of immediate value<sup>4</sup>. Adults also find it helpful when they can learn through the experience of carrying out activities which can lead to richer cognitive representations of the procedure being learned and hence better retention. Much of the research on lifelong learning has been related either to adults within the workforce or returning to organized learning<sup>5</sup>. After retirement the learner's personal goals are likely to expand beyond the subject matter to include the social context in which the learning takes place<sup>3,6</sup>. This has implications for the structure of learning activities for older adults, which need to create a positive interpersonal climate where participation is encouraged and people's prior experiences are valued<sup>2,7,8</sup>. As expressed by one researcher, "A bit of togetherness just before the lesson ends creates a desire to come again"<sup>9</sup>. The present paper recounts the experiences of a UK group of older adults seeking to balance the need for learning new content with the desire for social interaction.

Among the organisations providing such opportunities in the UK is the University of the Third

Age (U3A). Third Age refers to that time of life when full-time work and parenting responsibilities have subsided. In 1972 Professor Pierre Velas started the U3A in the Faculty of Social science at the University of Toulouse, France where the U3A was an outreach from the university with experts sharing their expertise. The university link continues in several other countries, for instance, Malta<sup>10</sup> and Switzerland<sup>11</sup>. Useful distinctions have been drawn between formal, non-formal and informal learning. Formal learning characterises instruction offered to young people by educational organisations. Non-formal learning is often job related and takes place outside educational institutions. Informal learning refers to the knowledge and skills acquired as part of everyday life. Others have suggested that formal and informal are opposite ends of a continuum and all learning involves contributions from both factors<sup>12</sup>. This will be the approach adopted here, recognising that there is evidence that older adults prefer learning in private, non-formal contexts<sup>11</sup> but that some topics may benefit from greater input from an instructor.

When the U3A reached the UK in 1981, the British emphasis shifted towards fostering self-help groups sharing mutual interests<sup>13</sup>. This is closely in line with current geragogic thinking where opportunities for older adult learners to set the cur-

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riculum themselves and to learn through activities of personal relevance have been found more successful than traditional didactic methods<sup>3</sup>. By August 2015 there was a UK national network of 964 U3A branches<sup>14</sup>. There are no academic requirements for U3A membership but the self-help format tends to attract retired professionals<sup>15</sup>. A UK survey in 2008 found the majority of members (74%) were women and the average age was 71, i.e. they tend to be the young-old<sup>15</sup>.

An opportunity arose for the author to contribute to a new special interest group whose members wanted to know more about using digital tablets. This paper reports on the activities and developments within that group during its first two years<sup>16</sup>. An online search suggested that when the group started in 2013 there were no other branches in the UK that had a Digital Tablets group, although in some branches the computing group may have extended a welcome to tablet users.

Why would older adults want to learn about digital tablets? Internet access is increasingly becoming a valuable part of daily life. Many organisations, both public and private find it economically attractive to distribute information via their websites (for instance, BBC, retail stores, government departments, etc.). Older adults also experience social pressures from younger family members, especially if the family is geographically dispersed. They are urged to use the internet as a convenient means of staying in touch. Indeed family support has been found to be one of the predictors of older adults internet use<sup>11</sup>.

Evidence has grown to dispel the myth that older adults neither can nor want to engage with digital communication technologies<sup>7</sup>. Researchers have suggested that many people continue or even increase their use of technology as part of their new retirement lifestyle<sup>18</sup>, and internet use by those over 65 years old has seen a marked increase during the past decade<sup>19</sup>. A UK survey found that the percentage of people who were aged 65 and over and used the internet daily rose from 9% in 2006 to 45% in 2015<sup>20</sup>. These figures are not typical of elsewhere in Europe<sup>21</sup> but a similar rise between 2000 and 2012 was found in the USA where 53% of adults aged 65 and over were accessing the internet in 2012, and of these 70% did so daily<sup>19</sup>. *Table 1* summarises the purposes for which older adults use the internet<sup>20</sup>.

Compared to smart phones, tablets with their larger touch screens are less fiddly for arthritic fingers to use and less taxing for the eyes of older viewers. They fit comfortably within a domestic

environment and need less space than a laptop. However, evidence that tablets are not as easy to use as they appear comes both from observational studies<sup>23</sup> and from the numerous publications explaining how to use specific brands of tablet<sup>24,25,26</sup>. For older adults who may not previously have used personal computers, and whose prior phone experience may have been with a landline, tablets pose a number of challenges. Even accessing the product user manual often requires the ability to download files from the brand's website. Focus group studies with older people, have reported that the lack of opportunity to get training is a barrier to internet access<sup>27</sup>. This paper reports some of the learning issues that faced new tablet users, and considers the scope for interface design being able to reduce the amount that must be remembered. The paper also reports the difficulties found in balancing the social and instructional elements of meetings. John suggested that three main factors contribute to the success of teaching older adults: physical characteristics, cognitive processes, socio-emotional needs<sup>9</sup>. But John was concerned with the frail elderly. For the present U3A group the process of self-selection as group members meant that physical characteristics, for instance, vision and mobility, tended not to be an issue. Much of the present focus will be on cognitive processes, for two reasons: firstly because it is well established that remembering new information and controlling attention can be problematic for some older adults<sup>28,29</sup>; secondly because there could be scope for design features of the tablet interface being changed to be more supportive of cognitive processes.

## METHOD

Participants were members of a suburban branch of the U3A in the UK<sup>16</sup>. During the 27 month period from May 2013 to July 2015 there were 76 people who attended at least one of the hour-long monthly meetings of the Digital Tablets group. 89% were female, which is consistent with the national gender imbalance mentioned above.

*Table 1. Main internet activities of UK older adults shown as a percentage of those in that age group using the internet<sup>22</sup>*

Internet used for:	% at different ages, years	
	55-64	65+
Emails	72	50
Information re goods/services	73	45
News / newspapers / magazines	53	32
Travel / accommodation	47	27
Information from Wikis	45	27
Internet banking	46	26

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## Procedure

The data reported are from monthly meetings (excluding December because of public holidays). These meetings were co-ordinated by the author and held in a hired room at a local community centre. Participants sat round the sides of a large rectangle of tables, with three or four people on each side. An emailed reminder of the topic for the next meeting was sent to group members five days before each meeting.

As outlined above, the format of meetings was guided by the principles of geragogy, recognising the need to empower group members to raise any issues, to determine learning goals and to benefit from peer support. These conversational activities will be reported below under the category label 'Chat'. The instructional elements of the meeting were guided by a task analysis of the goals to be achieved and by an understanding of the age-related challenges to cognition, particularly issues relating to memory and attention<sup>29,30,31</sup>. In recognition that these instructional elements relied heavily on learners carrying out procedures on their own tablets, these will be reported below under the category label 'Do'. Table 2 summarizes how the sequencing of the 'Chat' and 'Do' elements varied during the course of 27 months as problems arose trying to fit these elements into a one hour session, and solutions were explored. The specific activities within the 'Chat' and 'Do' categories are described below.

### Chat+Do

The original plan was to have three 20 minute slots at each meeting, dealing successively with (i) Discoveries made since the last meeting, (ii) Problems encountered or advice wanted, and (iii) a specific Topic chosen by the group the previous month. The first slot was intended to boost people's confidence by sharing discoveries they had made - for instance, how to find bus timetables or save photos they had been sent. The intention behind the second slot was to pair people who had problems with those who knew how to solve them.

Because the U3A is an inclusive organisation, initially the users of both Apple and Android tablets met together. It had been seen as desirable for both economic and social reasons to welcome all tablet users to the group. However, the variety

of tablets led to confused discussion (see Results) and so was changed.

### Do+Chat

The Apple and Android groups met separately but covered the same topic. The 'Do' activity was strengthened, affording better support for memory and attention, by providing procedural steps in a printed handout that was prepared by the person explaining the topic. These handouts were then uploaded to the website of the U3A branch and could be accessed from the Digital Tablets Group's web page<sup>16</sup>. People new to digital tablets found it hard to cope with meetings starting with walking through the activity guided by the handouts. Also the handout led to individuals working alone with little discussion (see Results), so the meeting format was changed.

### Demonstration+Do

The separation between Apple and Android was retained but the topic was introduced through a real time demonstration from a tablet linked to a projector. This functioned as an advanced organiser<sup>32</sup> for new tablet users, and enabled the practice activities to include more adventurous problem solving for those with greater tablet experience. One unanticipated drawback of projecting from a tablet was that cursor movements could not be shown. A tap could change the display so rapidly that the audience might not know what had been tapped, even though its name and position had been mentioned. The solution was to use a light pointer prior to tapping. A more serious problem was that the 'Chat' element was being squeezed out. So another change was made.

### Mini-Chat+Demo+Do

Meetings started with four or five topic-related questions, to foster social interaction and accommodate late arrivals. Then a demonstration was given of applications and/or websites related to the topic. This was followed by an opportunity to practice supported by a printed handout. A survey of what people used their tablet for was conducted at the end of the meeting in May 2015.

The U3A group was not constituted for research purposes and no formal ethical approval was sought for reporting the changes in the group's activities. No individual can be identified from the data reported here. People responding to the survey knew that their unattributed data would be made public. The other data (for instance, attendance) are aggregated and presented here in order to document the problems encountered and solutions

Table 2. Variation in the social and instructional elements within meetings

Period	Meeting activities	Problems experienced
May 2013-Nov 2013	Chat+Do	No time for Do
Jan 2014- Oct 2014	Do+Chat	Hard for new tableteers
Nov 2014 - May 2015	Demonstration+Do	No time for Chat
June 2015 - July 2015	Mini-Chat+Demo+Do	

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attempted by this group in order to help others planning similar instructional events.

## RESULTS

Because this was a naturalistic setting confounding factors are inevitable and quantitative data were not always available. For example, membership of the digital tablets group could not be expressed as a percentage of the branch membership because the branch grew in numbers during the 27 months. Only a ballpark figure could be provided. It was difficult to know how many members the group had at any given point in time because different people attended different meetings. Only after an absence of four successive months was it concluded that someone had left the group. Dropping in and out of groups was acceptable, even encouraged, in this U3A branch. This is consistent with the geragogy principle that older adults will want to be in control of what and how they learn. The usefulness of these results lies not in specific numbers but in highlighting the interplay of the time constraint on meetings on the success of satisfying both the socioemotional and instructional needs of participants.

## Attendance

During the 27 months 76 people attended at least one meeting. This was approximately 30% of the branch membership (numbers rose during that time) and indicated a widespread interest in digital tablets. The number of people attending a group meeting ranged from 19, which far exceeded the number that the room could comfortably hold, to zero at one Android meeting after the groups separated. The average monthly attendance was 10.9 in 2013, 14.1 in 2014, 15.1 in 2015. This suggests that interest in tablets was steadily growing but the people attending varied across meetings. Indeed the drop-out rate was high (Table 3). The average number of meetings attended before stopping was 2.50. The reasons for absence were often not known but when reported included health issues and family interruptions, with grandparents having to care for grandchildren and great-grandchildren especially during school holidays. It was noticed that the more experienced tablet users tended to stop attending, being replaced by a steady trickle of people new to using tablets. Table 3 shows that more people stopped attending the Android group than the iPad group ( $X^2(1,1)=4.99, p<0.05$ ).

Table 3. Membership numbers of the Digital Tablets Group in July 2015, by type of tablet

Attendees	Numbers (%) / tablet type	
	iPad	Android
Active	21 (48.8)	7 (21.2)
Stopped	22 (51.2)	26 (78.8)
Total	43	33

## Attendees' goals

People came to meetings for a wide range of purposes. They were not quizzed on why they came but all were made welcome, including three who came just to see whether a tablet was something they would want to own and to talk to tableteers about the experience of ownership. Consistent with the geragogy theory that older learners often have their own agendas<sup>3</sup>, there were people who came to the meetings who knew what it was they wanted to learn, and these people were happy to leave the group when their goals had been achieved. Because people's goals related to their everyday lives it was rare to find anyone with the attitude: "Now I own a tablet I want to know all the things I can do with it". But there were occasions when one member introduced a new application to the group (for instance, tracking the movements of shipping along the coast) that was greeted with delight by others who knew nothing about such applications.

One of the challenges facing the organiser of group meetings was that the people who came varied in their prior experience with computers and in the specific knowledge they wanted to acquire from the meetings. For example, some people were interested in using their tablet's camera but others were definitely not, either because they already used another camera or because they had no interest in photography. Among attendees' most common goals were emailing family and friends, especially when this involved sharing photos. This desire for email proficiency may have been heightened by the fact that several of the other groups at this U3A branch used email contact for updating members about meeting changes, etc. Table 4 summarizes a survey taken at the end of the May 2015 meeting and provides a snapshot of the diversity of internet applications used within the group, which reflects that of the UK as a whole (Table 1). People who played games reported that this both helped them to relax and they also felt it helped to keep their brain active. People who already had a computer at home commented that the speed and portability of their tablet (for instance, taking it into the garden) meant that they were using their tablet more often than their computer.

## Meeting formats.

As explained in the Procedure, during the 27 months covered by this analysis, the activities within the monthly meeting were adapted to resolve problems as they arose.

## Chat+Do

The first of the three 20-minute slots, an opportunity to share discoveries, usually received no input from the group. The reasons for this were

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Table 4. Applications used by the U3A Digital Tablets group of the end of May 2015 meeting; n=12

Application	Users
Photos	12
Google maps / Earth	12
Google Search	11
Weather	10
BBC News	10
TV live / catch-up	9
Online shopping	9
FaceBook	8
Skype / FaceTime	7
Booking theatre / events	7
Travel including holidays	7
Health	6
Magazines	6
Games	6
Music	5
Books	5
Track boats / planes	5
Clocks/timers	4
Local council	3
Write: letters, stories, poems	3

unclear. In the second slot, where people sought help and advice, when a problem was raised it would be echoed by others in the group who had experienced similar problems but only two or three people in the group volunteered solutions. So one-to-one pairing was not possible. Even when a solution was offered to the group as a whole, the diversity of tablets at the meeting resulted in people becoming confused if they were not able to carry out the recommended steps on their own tablet. This gave rise to discussions among people who owned similar tablets, and often the discussion of problems far exceeded the allotted 20 minute time slot with the consequence that the third slot, which was the chosen topic for the month, was curtailed or on occasion abandoned. This was disappointing for those who had wanted to learn about the topic, especially if they were among those who had not experienced the problems discussed.

In an attempt to retrieve the situation, the group's web page had a synopsis of the meeting that included notes on the topic. This website information was also useful to those who had not been able to attend that month's meeting. It also enabled people to become virtual members of the group, relying entirely on the website information about the topic.

## Do+Chat

To reduce the confusion that arose during group discussions about procedural steps it was decided to separate the meetings for the owners of iPads, including iPad Minis, from those using Android tablets. This resulted in smaller numbers per meeting but the attendees at smaller groups expressed satisfaction with being able to receive

more individual help from the one or two 'experts' in the room. Another advantage of smaller numbers was faster internet connection speed. When people connected their tablets to the local broadband WiFi in order to carry out the 'Do' activities, the connection speed could be slow if several people were using the network to download applications they wanted to try. This was very discouraging for people new to using tablets. For example, in the larger group when people were practising sending emails to each other across the room, they could be sitting for several minutes waiting for the email to arrive before they could reply.

To reduce these problems the meeting activities were restructured to start with the topic that the group had chosen. This avoided it being curtailed by discussion. Additionally, to compensate for the lack of one-to-one pairing, the topic was supported by a printed handout giving a step by step procedural guide that people could work through at their own pace, with the more experienced members offering one-to-one help to anyone encountering difficulties. These changes were successful and people felt they learned much more than with the previous meeting format; but people did the guided activity mainly on their own, and this limited the opportunities for group members to get to know each other. People became so engrossed in the 'Do' activities that the 'Chat' elements were attenuated. Not only was this teacher-led format inconsistent with geragogy theory it was also contrary to the underlying spirit of the British U3A where the emphasis is on peer group support such that 'the learners teach and the teachers learn'<sup>13</sup>. To redress this the duration of the topic's guided activity was cut to 30-40 minutes so that the last 20 minutes were available for group discussion. Even though the topic chosen by the group was briefly introduced before people started using the handout, it was found that beginning with the guided activity did not suit very inexperienced tablet users who easily skipped a step and became lost when following the written procedural details.

## Demo+Do

A tablet was linked to a projector and the group watched a demonstration of the software being used for the topic of that meeting. Many people found this demonstration very helpful, and by having only one active internet user the speed of tablet response gave a realistic impression of what people could expect when they were at home. A minor snag was that during the demonstration some people tried to follow along on their own tablet. If they encountered snags they soon found themselves out of synchrony with

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the demonstration and could easily become confused. So it was emphasised that after the demonstration everyone would be able to practice, supported by the printed handout. A more serious disadvantage of this meeting format was that it still resembled a formal 'class' in which people worked as individuals rather than enjoying interaction with other group members.

## Mini-Chat+Do

To address the issue of too little social interaction each meeting began with four or five questions relating to the topic. For example, when the topic was 'Health information on the Internet' the questions included *"Have you ever looked up health information?"* and *"How safe and reliable do you think online health information is?"* Questions such as these provided a structure for group discussion, a chance for group members to share experiences, and the topic explainer could move fairly quickly onto another question if the meeting was being sidetracked by anecdotes, so avoiding the problems of 'Chat+Do' above.

## New learning

Apart from remembering the specific steps for accomplishing tasks, such as sending emails, there were three sets of skills that tablet users needed to learn. One set related to the range of touch-screen gestures that were possible. Even people familiar with personal computers needed to learn a new style of interaction. Muttered grumbles could be heard around the room such as, *"I want to click the right hand mouse button but there isn't a mouse so what do I do?"* Another general skill that some people found difficult to acquire related to the distribution of attention to various objects on the screen. Thirdly, people needed to remember several task-specific procedures. Problems with the constituents of these skill sets are described below for instances where changes to the design of the interface (see Discussion) could reduce the problem.

## Gestures

It is among the myths of our time that to use a digital tablet all you have to do is tap with your finger on whatever you want. The reality is that the variety of gestures to be learned far exceeds those governing mouse use. Taps, swipes and pinches are categories of gestures. There are 'single taps', 'double taps' and 'long taps' (press and hold). The effects of these actions will vary with context, and newcomers can find it takes practice to get the timing right, as does remembering which kind of tap is needed in which context. Tapping menu items became harder when the menus were hidden and required tapping in an unmarked space, for instance, the edge of the screen, before they could be seen – and even

then they might not remain visible for very long.

Screens could also be 'swiped' up/down, left/right, sometimes from the middle of the screen and at other times from the edge. In some email applications, left/right swiping an item in the list of messages uncovered new menu options, but there was nothing on the screen to indicate that list items could be swiped. When intending to scroll down a web page the action of swiping sometimes caused a new page to open – i.e. the tablet mistook the start of the swipe for a tap. This may have been more common when using a stylus rather than fingers.

People easily learned that screen magnification could be changed by 'pinching' or 'spreading' the first finger and thumb, but gestures involving dragging caused more problems. 'Dragging' icons would move them but if contact was lost before reaching the destination the items might fly back to where they came from or, in some contexts, they might remain in the wrong place. Dragging on a photo that had been zoomed produced a different effect; it moved the part of the photo shown on screen. For newcomers, successfully predicting what dragging would do could be a challenge. One benefit of group meetings was that people shared their frustrations and received reassurance that others encountered the same problems - i.e. it was not their 'mistake'.

Although there were many gestures to learn, group members did not find that remembering these was their main difficulty. Most difficulties arose from accidental errors of execution. The problem of dropping items mid-drag has already been mentioned. More disturbing was the effect of accidentally touching part of the screen and having something unexpected happen without even knowing how this sudden change had been caused nor how to return to where they had been. For some people accidental taps were fewer if they used a stylus, and this also helped them select small regions of the screen (for instance, menu items); but for other people the stylus seemed to be just one more thing that they had to learn to master and they preferred to rely on their fingers which they had to use for multi-finger gestures anyway (for instance pinching). Being able to zoom the screen was appreciated by people not wearing their reading glasses, but was an option that not all application designers made available.

## Attention

One recurrent problem within the group arose because older adults often have a relatively narrow focus of attention<sup>31</sup>. As a consequence people could miss important information on

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the screen. When typing an email address they could be so focussed on the keyboard, with which many were unfamiliar, that they did not notice they were being offered completions from their contacts list that would save them typing the full address. Similarly people did not always notice that menu items, for instance at the top of the screen, had changed because these items were context sensitive. So people were hunting elsewhere for items such as Delete that had not been visible in the top task bar moments before.

People tended to ignore items whose task relevance was not understood. For example, when exploring Google searches, most people at that meeting had used Google before but only for textual searches. The group reaction was one of amazement when, after searching for the answer to a question (e.g. "When did Sinatra die?"), they were prompted to tap **Images** and see what happened. The menu item had always been there, and in the literal sense people knew what 'images' meant. They had never explored this menu item because they did not appreciate its possible relevance to their search target.

## Task procedures

While specific tasks could raise their own problems, a few issues recurred across tasks. For example, people easily forgot steps unless they understood *why* a step was needed. This was evident in the email mistakes made by group members. To several people the Subject slot seemed unnecessary. This step is not part of hand-written messages between friends, and people took time to realise the different demands of managing digital information. Meanwhile emails were sent with nothing in the Subject slot or with the entire message in it. Even some voluntary organisations send emails with personal names in the From slot and under-informative Subjects such as 'Newsletter'. It is too late for the digital convention of 'To', 'From', 'Subject' to change but adding a phrase such as 'Label for retrieval' would make its purpose clearer. It would have helped if the Subject slot had followed the message content because some of us do not know the full extent of what an email message will be about until we have written it.

Attaining the same goal (for instance, Deletion) through different procedures in different applications was another source of difficulty. New users can be unduly anxious that they will fill up their tablet and so they are keen to know 'how to get rid of stuff'. Many applications have a trash icon to tap, but iPad users will need to do a long tap on the Home screen and then tap the cross that appears on the icon itself. In other contexts, or on other tablets, people may need to drag items

to the trash instead of using the two-tap method of tapping to select the item then tapping delete or trash. Greater consistency in relation to procedures that are common across tasks would help all learners, not just older adults.

Related to this, and of special relevance to older people, some applications provided alternative ways of accomplishing task goals. For example, in email tapping the Trash icon may delete the currently open message. Selecting the item from the message list then tapping delete does the same thing. So too may swiping the message in the message list. Sometimes group members wanted to know which was the 'correct' method, and the pros and cons of the alternative procedures could be pointed out; but beginners often wanted to remember a single method, and ideally this would be a method that was common to many applications.

## DISCUSSION

The continued existence of this U3A special interest group for more than two years suggests that many older adults want to use digital tablets. In the month after the data curfew for this paper another 10 people expressed interest in joining the group. Tablets are attractive to people with no background in computing because these small, handheld devices appear very simple to use. Nevertheless, at meetings it was seen that people were often nervous about exploring on their own, and self-deprecating about their ability to master this new technology. They drew confidence from hearing about others' problems and triumphs. In line with geragogy theory, the evolving format of meetings sought a balance between imparting new knowledge and fostering social cohesion by enabling the exchange of ideas and experiences. Both the instructional and social elements were found to be critical features of these U3A meetings.

Tablet use by these U3A members impinged on all five of the main domains of life outlined by Bouma<sup>33</sup>. People searched the internet for health information and retail activities. They communicated with friends and family members via email and Skype. They planned journeys with the aid of Google maps, and checked train and plane times online. Hobbies were enhanced by YouTube videos showing how to crochet or prune shrubs. When one person commented that their tablet had become so enmeshed in their daily life that they now considered it indispensable, this sentiment was echoed around the room.

Dividing the group on the basis of tablet operating systems was beneficial. It had been logistically difficult to cope with the increasing numbers of new

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tablets within both operating systems, and it remained a challenge to find applications for guided activities that would run on both platforms. People were encouraged to annotate their handout to suit their own tablet. Separate handouts for the two groups simplified the structure of both meetings and reduced confusions, but considerable interface diversity remained within the Android group.

There are several possible reasons for the higher drop-out rate from the Android group (Table 3). On the one hand the availability of the online handout may have been sufficient for those with more experience of using tablets, and on the other hand the monthly meetings were probably too infrequent for complete beginners. Those in the iPad group could get support from the local Apple shop, whereas there was no such help for newcomers to Android. Knowing the basics of Tablet use (for instance, how to download and open applications) enabled people to get more from group meetings. Another possibility is that the variety of Android interface styles made it less likely that a newcomer would be sitting next to a person whose tablet interface looked similar. This reduced the proximity of assistance and also lessened the social bonds within the Android group and thereby made meetings less enjoyable. It is also possible that owners of Android tablets may be in some way systematically different from iPad owners. For example, if people saw iPad as the 'safe' purchase then perhaps continuing to attend meetings was also seen as the safe option. It has not been possible to pursue those who stopped attending in order to shed more light on these possibilities.

New tableteers could find themselves rapidly out of their depth at their first meeting because almost the first thing they needed to do was connect their tablet to the local WiFi. This would look complicated even when done for them by somebody else, and in spite of reassurances that they would not need to do it again next time. Providing assistance at group meetings to complete beginners was problematic. People disliked feeling their questions were holding up the group. Newcomers could become disheartened if they saw others following the guided activity when they were encountering problems. Consequently during the 27 months there was a steady trickle of people who were given individual assistance outside the group meetings to help them get to a basic level where they could cope with the group activities, perhaps eight or ten people in all. Books on how to use specific brands of tablet were not found helpful by these beginners. A 'How To' folder of mini-videos that demonstrated the steps needed for basic procedures might help. Solutions of this kind may become more

effective when split-screen technology reaches tablets. Nevertheless, not knowing the jargon for what they are trying to do is an entry hurdle for beginners.

Although starting meetings with the topic was partially successful, people with less experience of tablets found it most helpful when meetings included a large screen demonstration of that meeting's topic. As intended this functioned as an advanced organiser<sup>32</sup> and aided understanding by providing a framework for the guided activity as well as assisting communication by introducing some of the jargon terms (for instance, Menu, Home screen, icon) that permeate discussions about tablets. The demonstration worked well for the iPad group because their tablet interfaces were very similar, but it was problematic for the Android group where interface styles varied. However, this diversity provided evidence that some of the challenges posed by tablet interfaces could have been avoided<sup>34</sup>.

Several researchers have suggested desirable improvements to the tablet interface that would enhance its use by everyone<sup>35,36,37</sup>. All three categories of learning problems could have been reduced by changes to the interface. Most people found the language of gestures was fairly easy to learn, with the possible exception of distinguishing short and long taps. Nevertheless it was easy for people to make action slips that caused frustration. As was mentioned above, accidental activation of parts of the screen would have been much less alarming for everyone if all tablets included an 'Oops' or 'Undo' button. This was a valued feature of the pocket computer interface designed for adults with memory loss resulting from acquired brain injury<sup>38,39</sup>.

It is well established that people tend to narrow their attention when there are other demands on working memory<sup>40,41</sup>. The likelihood of people missing new screen information could be reduced by making menu changes more visually salient, for instance, changing the task bar's background colour to flag the arrival of new menu items. Overwriting icons in subtle ways can seem a neat, space-saving solution to designers but a balance is needed between clever design and a comfortable user experience. Designers may anticipate that their users will only be bamboozled the first time but if applications are used infrequently, then each time can feel like a first time. When people use several applications, remembering where to look adds to the burden of remembering what to do.

Interface design changes could also have helped people learn the procedural steps for specific



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tasks. It would assist everyone if there were greater consistency across tasks for common procedures such as adding or removing information. Achieving this consistency probably awaits the emergence of conventions. Unfortunately the tendency for companies to claim exclusivity for their interface features militates against such consistency arising any time soon.

Older people are often aware of their cognitive limitations and when possible will select among interface options to compensate for these<sup>42</sup>. It is a prerequisite that interface designers know what options to provide to support the sizable group of older tablet users. A recent survey of professional web designers found that fewer than 20% of those who responded were aware of design guidance from the World Wide Web Consortium on how to enhance accessibility for older people<sup>43</sup>. Indeed this industry survey found that the needs of older tablet users were seldom considered even though many sources of advice are available<sup>44,45</sup>.

Cultural differences could also be supported through interface options. In one study older Caucasian adults considered a 'minimalist' interface easier to use than one having additional screen elements (both text and icons) that were task-relevant but not essential. In contrast, age-matched Asian participants preferred the repeated instructions and icons of the more detailed interface<sup>46</sup>. These interface preferences were not reflected in performance differences, neither between the participant groups nor between the two interface styles. However, this might easily change outside the laboratory when people choose whether or not to use the interface at all.

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Offering easy access to alternative interfaces may be the viable antidote to a one-size-fits-all approach. One example of this helpful design is the Photo Editor of Photoshop Elements 11 where three tabs at the top of the screen (Quick, Guided, Expert) let people select the amount of complexity they wish to deal with. Tablet users have long been encouraged to 'customise' their tablet, but often in relation to appearance (for instance, wallpaper) rather than to function. The mileage to be had from providing functional options via alternative interfaces within the most popular tablet applications has yet to be explored.

Meeting the interface challenges posed by user diversity is important because even within a single culture older adults vary physically, economically and mentally. The participants in this study did not capture the richness of that diversity but tended to be the healthier and cognitively more able young-old adults in the local community. Given the evidence that cognitive ability<sup>47</sup>, and particularly the strength of working memory, relates to successful computer use<sup>48</sup> it seems probable that the interface problems encountered by the present participants would have been found even more challenging by people without professional backgrounds or with significant health issues.

In conclusion the experiences of the members of this U3A group have highlighted that accessing the internet via tablets is only easy once you know how. Peer group meetings, if appropriately structured, can afford welcome support and a useful learning resource for older adults and thereby help to offset some of the infelicities of the design of tablet interfaces. Acquiring a digital tablet, and the skills to conquer it, affords the potential to enhance the quality of life of many older adults.

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