Crafting Textile Connections: A mixed-methods approach to explore traditional and e-textile crafting for wellbeing

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Abstract: Textile making is known to improve wellbeing (Vercillo, 2012; Kenning, 2015) and according to Yair (2011), group crafting activities can also produce multiple therapeutic, cognitive and social benefits. By engaging in group crafts with textiles, individuals can give, be active, learn, take notice and connect with others – all factors associated with wellbeing (Aked & Thomson, 2011). However, as a relatively new phenomenon (Kenning, 2015) this has not yet been analysed in detail using wellbeing scales or matrices. This paper discusses three textile-based craft workshops as case studies where wellbeing factors pertaining to social interaction and connectedness were observed and measured. Workshops weremeasured quantitatively using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) and qualitatively, through thematic analysis of conversation. Our results align with related works, demonstrating an overall increase in wellbeing following participation in textile crafting and explores new territory for wellbeing studies.

Keywords: Textiles, E-textiles, Craft, Wellbeing, WEMWBS

1. Introduction

Defined generally as 'feeling good and functioning well', wellbeing is understood as key to maintaining our physical and mental health. Physical wellbeing is measured more tangibly than our mental wellbeing which can be conceptualised in terms of subjective emotional and social factors. Emotional wellbeing is described as; having capacity to realise our abilities; living our lives with purpose; forming positive relationships; experiencing happiness and contentment; and being confident and resilient. Social wellbeing on the other hand depends on social equality, capital and trust where individuals feel they can contribute and belong to their social circles and wider community (FPH, 2018).

Feeling disconnected from our social worlds can be detrimental to our mental wellbeing as it can lead to negative experiences, behaviours and poor health. For example, individuals who feel disconnected are 64% more likely to develop dementia than those who are not (Campbell, 2012). Individuals experiencing higher levels of social connectedness (e.g. strong interpersonal relationships) are better able to cognitively manage their needs and emotions. This makes them less

prone to develop low self-esteem, anxiety and depression (Lee & Robbins, 1998) and leads to higher levels of interpersonal trust, which benefits mental wellbeing.

The Office for National Statistics describes wellbeing as not only key to health but as being the foundation for our choices in terms of work and learning, interpersonal relationships, lifestyle and how we contribute to society (Jones & Randall, 2018). They highlight domains for wellbeing including; subjective wellbeing; life expectancy, mortality, illness and disease; mental ill-health and mental-wellbeing; and health and life satisfaction. These domains are investigated using various analysis methods to capture a picture of the wellbeing of the whole population and there is no agreed definition for what constitutes good wellbeing. Forgeard et al. (2011, p 81) also critiqued the 'blurred and overly broad definitions of wellbeing'. Lack of consensus on a definition prompted Dodge et al. (2012, p 230) to study the field, generating a definition for wellbeing as, 'the balance point between an individual's resource pool and the challenges faced… stable wellbeing is when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge.'

1.1 Related Work

Creative activity benefits both physical and mental wellbeing. Previous studies in behavioural sciences, social work and art education (Almeida et al., 2012; Maidment & Macfarlane, 2011; Titus & Sinacore, 2013) identify making as; helping individuals to feel more able to cope with challenging physical issues, emotions and thoughts; and attribute participants improved self image, quality interpersonal relationships and general wellbeing, to on-going participation in arts and crafts. Crafts such as knitting, sewing and crochet provide immersive and playful experiences through repetitive action and tactile technique. They are clinically proven to raise mood-enhancing levels of serotonin and induce relaxation (Yair, 2011), and are noted as '[balancing] and [unifying] the needs of both body and mind' (MacEachren, 2004, p145). Within their 'Internet of Soft Things' study Glazzard et al. (2015) explored possible relationships between e-textiles and mental wellbeing. They employed a 'non-judgemental attitude' within co-design workshops and reported that participants felt free to explore their creativity as a result, positively impacting their wellbeing. In this study, the researchers intervene only to support participants in problem solving and task completion, but strive to cultivate a supportive environment.

This research builds upon previous work and acknowledges that wellbeing is a complex concept that is difficult to define. The approach we undertake in assessing wellbeing within this study merits mixed-methods to measure any possible impacts textile making can have upon wellbeing.

2. Context

Across cultures textiles are ubiquitous, formed and used to; comfort and care; protect our bodies; and communicate and project our personality, values and beliefs. As material they are sensory objects engaging our sight, touch, sense of smell, and even our hearing. They 'help us communicate and learn, add beauty and stimulation to our days, and make our lives richer' (Gordon, 2013, p 202). Through technological and scientific advances the sensory experiences afforded by textiles have been further extended as traditional textiles are combined with digital components like power, light, sound and small computers to create smart or e-textiles.

E-textiles are acknowledged as crossing craft and design discipline boundaries by merging technological functionality with textile physicality (Buechley & Eisenberg, 2008). E-textile crafting is rather different to traditional textile crafting. Whilst both crafts utilise fabric and soft or wearable

materials as their core medium, e-textile crafting is more closely aligned in practice to electronics where makers work to 'rules' using modular construction components, kits and techniques to create electronic systems or concepts (Perner-Wilson et al., 2011, p61). In merging craft with electronics, e-textiles links the digital with the physical, inviting makers to draw from and build upon the qualities of a wide range of raw materials and characterise technologies in new ways. E.g. enabling electronics to be 'fuzzy, stretchy and colourful' (ibid). Mellis et al. (2013) describe e-textile crafting as 'diverse', engaging many people, working at different skills and levels in making. Combining craft practice into the creation of electronics or technologies also introduces new skills, goals and outcomes (ibid).

Previous studies have examined textile crafting for wellbeing qualitatively by thematic analysis of conversation during or about making. '*Crafting Wellbeing'* (Kenning, 2015) interviewed lace-makers to identify primary themes related to wellbeing including health, self and identity, community and sharing and learning and growth; and *'Voices of Knitting'* (Corkhill et al., 2014) aligned descriptions of makers' feelings and emotions as they worked, to The WHO model for wellbeing.

Previous studies suggest that textile crafting can enhance wellbeing. This study builds upon this but employs both quantitative (wellbeing scales) alongside qualitative (conversation) methods to measure and learn about some of the factors contributing specifically to social wellbeing. The research questions explored are:

1. Can we empirically evidence wellbeing brought about by traditional and e-textile crafting?
2. What can we learn about wellbeing and textile crafting from gathering quantitative and qualitative data?

We highlight three workshops as case studies, the first and third hosted at University of Dundee and the second at a local community hub. Participants were recruited within the locality through professional networks and social media promotion. In this study we focus on how the process and products of the crafting impacted positively on participant's wellbeing within the sessions.

3. Ethics

This research was conducted with the ethical approval of Duncan of Jordanstone College of Art & Design Research Ethics Committee. Recruitment was conducted through University channels and social media. Participants in Workshops One and Three were self-selected by purchasing tickets for the workshop experience. Participants in Workshop Two (service users of a local charitable organisation providing food shopping and social activities) volunteered to take part in the workshop via conversation with their service coordinator. Participants in all three workshops were aged 16 years and over and able to give full consent to participation.

3.1 Data Collection, Analysis & Storage

Audio recordings and photographs were captured during the workshops with participants' consent. Survey data was collected using a wellbeing scale before and after the making activities in Workshops One and Three. All data was anonymised and the scales were entered into SPSS and descriptive and statistical analyses performed using t-test and ANOVA.

4. Method

Key to understanding the experiences and wellbeing of participants during this study were the gathering of their own reflections (revealed in conversation, questionnaires and WEMWBS scales scored during workshops); and researcher observations of both the interpersonal exchanges and the physical artefacts created. Participant observation (DeWalt & DeWalt, 2011) was employed to learn explicit (that which people are able to articulate about themselves) and tacit (that which is expressed without words) aspects of participants' crafting experience. In this study, researchers managed dual-roles as participant (in conversation; design support; and problem solving) and observer (of design activity and participant interactions).

The use of validated self-scoring scales in combination with conversation (i.e. informal interview) and observation allowed for triangulation of the data.

4.1 Workshops: E-textile and Traditional Textile Crafting

This study used participatory design workshops to gather qualitative data by engaging participants in textile crafting as a vehicle towards exploring and understanding its' impacts on wellbeing. Textile crafting provides participants with the opportunity to learn new skills, challenge themselves, meet other makers and build relationships (Kenning, 2015). In all workshops participant creativity focused on personalisation and researchers encouraged them to be hands-on in exploring materiality, construction techniques and aesthetics. And in the case of Workshop One, participants learned and exercised computational making - a process derived from computational thinking (Rode et al., 2015) which explores the possibilities of tangible interfaces in support of learning (Marshall, 2007; Marshall et al., 2010).

The aim of each workshop was to introduce participants to a form of textile group crafting and support them in creating personalised textile object(s) as extensions of our soft social and communication skills in support of wellbeing. All three workshops were designed to follow the same core process (Figure 1). Workshop One, hosted in association with Craft Council UK's Make:Shift:Do festival, invited participants to combine traditional craft sensibilities with electronic circuitry create an e-textile bird companion to take home. Linked with the continued rise of DIY and maker culture, where identity production, skill, participation, sharing, community, education and empowerment are emphasised as key motivators in crafts (Tenenbaum et al., 2013), this workshop sought to identify and measure factors associated with wellbeing.

Workshops Two and Three, hosted in response to the findings of Workshop One, explored traditional textile crafting in relation to wellbeing. Traditional crafting entails manual practice, using tools and hand construction techniques to manipulate, shape or build with raw materials (Mellis et al., 2013). In all three workshops, the act of crafting was a key task in facilitating individual creativity, social interaction and problem solving - experiences that can all be linked to wellbeing factors.
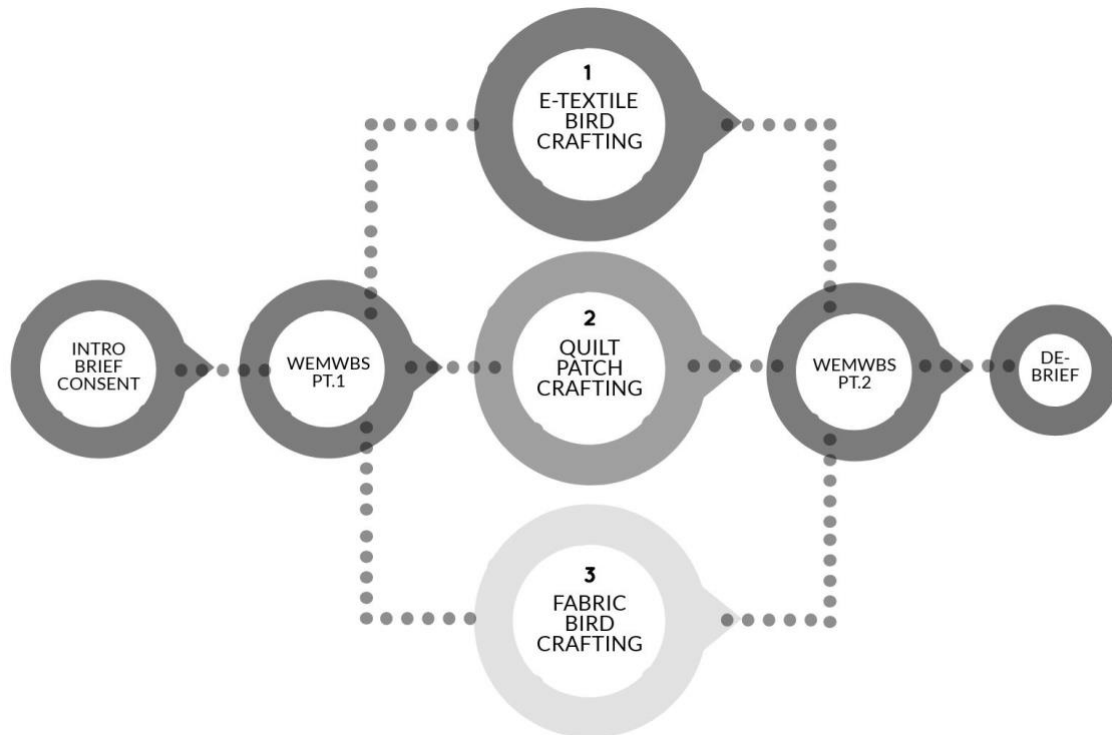
Fig 1. All workshops were designed to follow the same core process; the core making task is the only planned difference in the activity flow.

Fig 2. Left to right, the creations from; Workshop 1, e-textile birds; Workshop 2, fabric quilt patches; Workshop 3, fabric birds.

4.2 WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale

WEMWBS, developed in 2007 by a collaborative team led by the University of Warwick and University of Edinburgh, is a positively worded scale with 14 items relating to positive attributes of mental health (Stewart-Brown et al., 2011). The 14 items are made up of statements such as 'Lately', 'I have been feeling useful' and 'I have felt loved' and ranked by the participant against five options: 'None of the time', 'Rarely', 'Some of the time', 'Often' and 'All of the time'. The researcher can then use this to give each participant a score, i.e. 1 for 'None of the time' and 5 for 'All of the time', with a minimum score of 14 and maximum of 70. WEMWBS has been verified for use with teenagers from age 13 and over and exists as a shorter 7 item scale (SWEMWBS) (Clarke et al., 2011)

This study employed WEMWBS due to the construct measured - mental wellbeing- and its' positive wording and flexible length of content (7 or 14 items). This allows researchers to change to the smaller scale if needed (Stewart-Brown, 2015). All 14 items relate to things that are readily identifiable by the general public as valuable and relevant to mental health such as 'lately…I have been interested in new things', and easy to understand and respond to. This makes is popular with both patients and the public (Stewart-Brown, 2013).

In a study to 'identify the views of people with psychosis and affective disorder about the relevance and acceptability of commonly used outcome measures', Crawford et al. (201, p336) found a recurrent theme concerned with the dominance of what were perceived as too many 'negative' items in most questionnaires. Twenty-four widely used outcome measures were presented to expert groups of service users and group members remarked that they found it upsetting to be asked long lists of questions about difficulties associated with mental ill health. Conversely, the WEMWBS scale was commended for focusing on aspects of good mental health, where poor emotional health is indicated by not endorsing these 'positive' items (ibid). It was also important that the scales focused on general wellbeing and not health as a whole. Scales that look at more than wellbeing may become intrusive asking questions about suicidal thoughts and sex life for example.

The WEMWBS scale has been used to assess the effect of interventions on wellbeing such as counselling (Collins et al., 2012) and the use of cognitive behavioural techniques within the workplace (Bhutani, 2015), as well as parenting skills programmes upon parents' wellbeing (Simkiss et al., 2013). It has also been employed to understand the wellbeing of populations in comparison to the national average to; assess older people (Cooper et al., 2014), students (Davoren et al., 2013); family carers of those living with dementia (Orgeta et al., 2013); Irish and Scottish adolescents (McKay and Andretta 2017); Chinese and Pakistani populations living in the UK (Taggart et al., 2013); and users of secondary care mental health services (Bass et al., 2016). WEMWBS has been used in many different areas, however its use in this study is novel in a) assessing textile-based crafting as a wellbeing intervention; and b) applying WEMWBS in a research area where the use of matrices and measuring scales have been underexplored.

5. Findings

5.1 Participants

Participants in all three workshops described were exclusively female and self-selected to participate. Whilst e-textile crafting is not considered gender exclusive, other studies have also observed a tendency for female participation in textile crafts. Riley et al., (2013) note in their '*Voices of Knitting'* study that almost all participants were female and McBrinn (2015) highlights certain crafts - including textiles - as being under-practiced by males. However as Parezo et al. (1987) note, sex specificity is not inherent to the practice and production of any craft.

5.2 Workshop One – Crafting connections for wellbeing using e-textiles

Participants purchased tickets through Eventbrite for 'Crafting connections for wellbeing using e-textiles' as part of Make:Shift:Do festival of making 2017 at Duncan of Jordanstone College of Art and Design (DJCAD), University of Dundee. Fifteen female participants aged 17-60 years participated through this self-selecting process.

Once briefed and consent gained, participants completed WEMWBS survey before and after engaging in making activity (Figure 1) – constructing and personalising 3D interactive birds using a specially designed e-textile instructions kit. The kits contained needles, thread, scissors, conductive thread, conductive fabric, sewable LED, coin cell battery and sewable holder alongside PDF instructions (Figure 3). Supported by facilitators, participants worked in pairs to sew soft circuits into their birds using the kits with each bird comprising half of the circuit; when placed together the circuit is completed. All participants successfully created working soft circuits and birds in the session. When the birds are paired their LED eyes light up creating a physical embodiment of

connectedness (e.g. 'Their eyes lit up when they met'). Birds inspired the form of the e-textile object within for this activity due to their social nature and connections with wider world E.g. the phrase *'take under your wing'* means the act of caring for another.

Fig 3. *Left to right, tools used in Workshop 1: e-textile bird instructions; fabric pattern; e-textile component kit.*

As they crafted, a number of social exchanges - or 'magic moments' - were observed including; storytelling which established social connections and bonds. One participant shared: *'I've chosen this lovely map fabric and cut the pattern from the section showing France as my sister lives there and I want my bird to symbolise my connection with her - we're flying there for a visit next year'*. Feelings of empowerment in learning and accomplishing new skills were also mentioned, *'[There's] something so satisfying about making your own [textiles]'*; and knowledge exchange as participants shared their own methods and learning as their bird developed. For example, in reference to turning their bird from inside to right side out, one participant asked another, *'How do you turn it round?'* before being advised, *'I used a pen to push it through.'*

This workshop combined traditional hand and machine sewing with e-textile making. Participants' sewing experience varied from never having used a sewing machine to currently learning to sew, to having made their own clothes or quilted for many years: *'My mum taught me how to sew and when I was at school I used to make all my own clothes'*. This created a culture of skill sharing amongst the different ages and skill sets with participants encouraging each other: *'How are you getting on?'*; *'Failing at sewing, but getting there...'*; *'Keep going it's looking great'*.

Additionally, participants were learning new skills when it came to sewing their circuit. Unlike traditional sewing where one continuous length of thread is used to stitch up an object or garment, conductive thread is treated more like wire, joining one component to the next with separate lengths of thread to create a circuit. Participants found this element of the workshop challenging: *'I have finished my stitching but the LED isn't lighting up - I don't understand why this isn't working?'*; *'I have made a mistake with my sewing but I'm running out of time... I hate giving up so I can't leave until it's working.'* Other participants who did not encounter this difficulty offered practical advice to their fellow makers, inspecting birds for circuitry problems as well as giving verbal support: *'It doesn't work yet – but don't worry, [learning is] what it's all about';* *'You know where you've gone wrong now, I believe in you, you can fix it.'* Once the birds were made and working there was a great buzz in the room with participants proudly showing off their birds lighting up.

Participants WEMWBS scores were analysed using a paired samples t-test, compare wellbeing scores before and after the workshop activity. There was a significant increase in wellbeing from before (M = 50.79, SD = 6.67) to after (M = 54.50, SD = 7.41) the crafting activity, $t(13) = -3.26$, $p < .01$, $d = .87$, when e-textile crafting were used.

This demonstrates that participant wellbeing was higher after the activity of making an e-textile bird.

5.3 Workshop Two – Personalised Quilt Patches

In Workshop Two, twelve female participants aged 65 years and over volunteered to participate in a textile quilting activity in collaboration with a local charity. Of the participants who live alone, eight identified as widowed, two as single and one as divorced, One participant identified as married and living with their spouse. The workshop was hosted at a local community hub and participants were supported during the activity by a team of three service volunteers and one researcher. Participants worked individually but sat together in two groups, expressing their motivations to participate as the activity was themed around their hometown, Dundee, providing opportunity to talk and meet socially with peers. Participants were briefed and consent obtained before they completed WEMWBS scales and began the craft activity.

Choosing from a set of illustrated fabric patches depicting scenes from Dundee and decorative materials including embroidery threads, buttons, beads, fabric paints, pens and pencils, participants personalised their patches. Almost all participants chose to work with fabric dye pencils that perform like watercolour pencils - applying water to the fabric using a brush activates the pencil to colour the material (Figure 4). Participants favoured these for their novelty; *'I had no idea these pencils existed! It's so clever that you can use them on fabric like this'*; *'It's completely changed the look of [the patch] very quickly'*. Participants also enjoyed the therapeutic aspects of this technique. One participant noted that it was *'like colouring in – it's relaxing, but different on fabric and you could use this patch in lots of ways'.*

Fig 4. Participants' design choices influenced one another: left, participant added feathers; right, another participant followed suit.

As they worked, discussions and storytelling related to identity, shared history and creative skill were observed; '*Old Dundee*' pride was triggered as participants relayed their experiences of working *'in the mills'* (related to a patch depicting a loom shuttle) and the nursing profession (related to a patch depicting the Royal Victoria Hospital); laughter was elicited as they remembered the adventures of '*Oor Wullie*' (related to a patch depicting the local comic character); and encouragement and satisfaction was produced as participants complimented and took inspiration from one another's design approach and choices. These memories, stories and exchanges occurred naturally, driven by participants own engagement with the activity and reflection on their creations. In between these moments of interaction, participants worked quietly and calmly on their patches.

Although participants completed the WEMWBS scale before the activity, shortness of time prevented participants from completing a second WEMWBS scale as planned. The results revealed participants' wellbeing (M= 47.75, SD = 8.85) as falling below the average WEMWBS recorded scores for UK adults aged 65 -74 years (M= 51.93, SD= 8.66) and 75 years and over (M= 50.96, SD= 7.99). In particular,

scores for statements such as '*I feel a sense of togetherness with my peers*' and '*I feel close to other people*' scored low. Only one participant identified as feeling '*connected to the world around me*' '*all the time*'.

Participant conversation was recorded and analysed. Statements and conversation related to wellbeing factors from the WEMWBS scale were noted (e.g. '*feeling relaxed*', '*feeling interested in others*'), as were those reflecting participants' mood and tone. These statements mostly reflect a positive experience and contrast with some of the responses gathered using the WEMWBS scale. For example, participants conveyed connections with one another through shared actions and choices; '*We're both artists now - we've signed our work!*'; '*We [three] were all attracted to this [patch] for the floral design - same taste!*' Participants were also observed to engage in physical interaction, leaning in or patting one another on the arm in camaraderie as they worked and several participants gave positive feedback before leaving; '*That was something completely different - I so enjoyed it.*'; '*I can't wait to give this to my grandson, he'll be so proud of me*'; and '*I'm so pleased with my patch I've even signed it!*' With these statements supporting drivers identified by The Five Ways to Wellbeing (specifically learning something new; giving; and being active), this activity can be viewed as positively contributing to participants' state of wellbeing.

5.4 Workshop Three – Crafting connections for wellbeing using traditional textiles

Following Workshops One and Two, a third workshop was conducted to fully explore whether the wellbeing effects produced through traditional textile crafting would differ from e-textile crafting and observe any differences between quantitative and qualitative data collected within the workshop.

Employing the same self-selecting recruitment method and workspace as in Workshop One, thirteen female participants aged 29 -65 bought tickets for the '*Birds of a Feather*' workshop via Eventbrite. Following the same process as in Workshop One, participants were briefed and consent gained, they then filled in a WEMWBS survey before and after taking part in a making activity (Figure 1). In this workshop, inspired by the idiom, '*birds of a feather*', participants already engaged or interested in textile making, were invited to craft and personalise a 3D textile bird. Participants were provided with the same kit as in Workshop One excluding the e-textile components and instructions.

As with Workshop One and Two social exchanges were observed. Without the additional task of sewing circuits and working with electronics, this workshop provided participants with more time to personalise their birds and required less instruction from the facilitators/researchers. This allowed participants time to get into the flow of making and discuss topics such as retirement, family, their motivations for textile making and who taught them to make.

Similar to Workshop One, participants sewing experience varied, two of the participants had never used a sewing machine before and attended to learn how to use one. The majority of the participants had significant sewing experience, being lifelong makers including patchworkers, members of Dundee Embroidery Guild and a group of friends who meet regularly to craft and chat who called themselves the '*Crochet Cafe*'. ''*The 'Crochet Café' - that's us… We sometimes have more coffee than crochet –sometimes it doesn't even make it out the bag.*' The participants with more sewing experience were able to quickly construct their bird using the sewing machine and therefore had more time to personalise their bird using the embellishments provided including feathers, bells, sequins and buttons. As observed in Workshop One, these group members were also then able to help those new to sewing, fostering an environment of encouragement and skill sharing. Themes within the workshop formed with participants sharing and copying each other's methods of accessorising, feathers were added to tails and used to create crests on heads (Figure 5). Bells were

added for decoration and sound and a pattern for wings was made by one participant and shared with the group to add elaborate wings.

Fig 5. Participants' design choices influenced one another: left, participant added feathers; right, another participant followed suit.

When asked about their motivations for making participants focused on the therapeutic aspects of textile crafting. Some make for '*sanity purposes*' and '*escapism*' helping them focus on something else: '*A lot of the time I am quite stressed at work so [craft is] a good thing to do for your health - or for me -because it makes me focus not on work.*' One participant expressed that they ''*Would never have survived 40 years in academia without crafting.*' Family members and neighbours were also credited as catalysts for making: '*When I learnt to knit it was my Dad that taught me.*'; '*I think I always did crafty things because my Gran and my Mum make*'; '*I remember my Gran taking me round to my neighbours' aged maybe 8 or 10 for her to teach me how to crochet 'cause my Gran couldn't crochet –I still have never really mastered it –if someone showed me now I could do it but ask me 6 months later I couldn't –I just don't do enough of it.*' Participants previously unknown to one another, were also observed to share deeply personal experiences about an important life transition, retirement:

Participant 6: 'I retired a week ago on Monday [from teaching Home Economics] I specialised in food because my food was [less good] and my textiles was quite good. I've been teaching for the last 20 years. That is me out of teaching now which is sad – I am trying anything new.'

Participant 4: 'So you will still be reeling from the excitement of retiring?'

Participant 6: 'Well therein lies another tale unfortunately.'

Participant 4: 'Oh yes… I had to retire for medical reasons earlier than anticipated – I went with a bit of a grudge.'

The unstructured conversation facilitated by the textile craft activity allowed participants to share and bond with each other in a safe and open space. Analysis of the qualitative data from these conversations revealed strong themes around social connection, skill-sharing, and acknowledgment of the mental wellbeing benefits produced through making.

As in Workshop One, a paired samples t-test was conducted to analyse the WEMWBS scale results. This demonstrated that there was no significant difference in wellbeing before (M = 50.77) and after (M = 52.93) crafting, t (12) = -1.96, p = .07, when traditional textiles were used. Whilst the statistical results are not significant, the results do show an increase in wellbeing scores and therefore support traditional textile crafting as beneficial to wellbeing.

6. Discussion

This study aimed to answer the research questions:

1. Can we empirically evidence wellbeing brought about by traditional and e-textile crafting?
2. What can we learn about wellbeing and textile crafting from gathering quantitative and qualitative data?

We have observed that whilst e-textile and traditional textile crafting experiences can be very different - and consequently produce different impacts upon wellbeing - employment of the WEMWBS scale, has demonstrated positive changes in wellbeing following both e-textile and traditional textile crafting.

In Workshop One statistical analysis revealed a significant increase in wellbeing as a result of e-textile crafting. In Workshop Two, whilst statistical analysis was not possible due to participants not completing a second comparative WEMWBS scale, analysis of participants verbal expressions during the activity debrief reveal positive impacts upon mood and general wellbeing state following traditional textile crafting. In Workshop Three, whilst statistical analysis did not demonstrate a significant increase in wellbeing after the crafting of traditional textile birds, a similar pattern is observed as in Workshop One, with wellbeing scores being higher following completion of the activity. We hypothesise that the statistically significant increase in wellbeing observed in Workshop One may be most likely attributed to the additional learning experiences afforded by engaging in e-textiles crafting; allowing participants to learn new skills produced a unique sense of accomplishment.

Through using a mixed-methods approach, we can gain both a sense of the bigger picture of participants' wellbeing state, and hone in on the finer details and context of factors contributing to any wellbeing changes. For example, in Workshop Three, Participant 3 against the statement 'Lately, I feel relaxed', scored 'rarely' before, and 'sometimes' after the session. During the workshop this same participant discussed the busyness of family life and not often having the opportunity to finish creative projects. During feedback at the end of the workshop she stated, '[*I feel relaxed] and that doesn't happen often!*' Whilst the improvement in her relaxedness scores from the WEMWBS scale is slight, this in combination with her comments highlighted the value of crafting and the context within which this may have impacted her wellbeing state. This mixed-methods approach will contribute to future work where we will interrogate both sets of data in greater detail.

This study merits consideration of the use of quantitative methods to understand the role of e-textile and traditional textile crafting upon wellbeing. We acknowledge the challenge of gathering 'hard' evidence about 'soft' skills and experiences related to wellbeing. Whilst previous qualitative studies have evidenced that crafting in general can produce positive wellbeing effects through quotes from participants, by utilising the WEMWBS scale, this study has generated substantiated statistical evidence of wellbeing improvement. This not only enabled the assessment of textile crafting's contribution upon specific wellbeing factors, but evaluation of the impact of the design activity itself. The latter is particularly key as design increasingly intersects disciplines like healthcare, where there is not only the scientific evaluation of data, but also the evaluation of a method and approach (or intervention) to show its effectiveness.

7. Conclusion

In this paper, we discussed three textile-based craft workshops as case studies and empirically evidenced the positive impact of textile crafting upon wellbeing. The use of both wellbeing scales and qualitative data analysis from Workshops One and Three revealed an increase in wellbeing upon completion of the activities. Without a second comparison scale being gathered in Workshop Two, statistical analysis of any changes in wellbeing states was not possible. However, analysis of participants' verbal and physical interactions indicated positive wellbeing impacts as a result of the craft activity. The process of crafting produced benefits including creating a relaxed atmosphere and opportunity to learn from and feel close to peers.

Additionally, 'magic moments' were observed where individuals showed interest in others, a willingness to share their creations and helping each other to achieve the textile outcome. However we also recognise that the method itself (e.g. group discussion) can create positive wellbeing experiences as participants share, connect and learn from others. We found the sole use of self-scoring scales like WEMWBS can negate the need for interpretation. It is important that the participants' own perceptions of factors pertaining to their wellbeing is also captured when using wellbeing scales as this will afford scientific comparison of any changes in wellbeing.

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