



Examining Functional Unisex Gardening Apron for Master Gardeners

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The Master Gardener Program is a recognized Extension volunteer program active in all 50 states in the United States. Master Gardener volunteers are specially trained in a variety of horticulture topics and volunteer their time teaching and contributing gardening skills to their community (Roti, 2018). A majority of Master Gardeners and their clients are retired baby boomers and they have different body types and physiological and psychological clothing needs (Borcherding & Bubonia, 2015). Our market research indicated that current gardening gear has limited utility for the range of functions gardeners regularly need. Thus, the purpose of this project was to explore current Master Gardeners' needs and develop a functional unisex gardening apron suited to a baby boomer market.

This study is based on a sequential exploratory mixed method (Creswell, 2009) which consists of three phases: a) market research and a focus group interview of certified Master Gardeners to devise strategies for prototype development; b) a prototype was developed for online survey stimulus and fit testing; and c) an online survey was distributed to the current Master Gardeners (N=175) by Extension Program Coordinators to examine how current Master Gardeners evaluate and perceive the prototype. The design process followed an overall user-centered design (UCD) framework (Watkins & Dunne, 2015). One member of the design team was an Extension Coordinator for our local Master Gardeners and a gardener herself provided ongoing user input throughout the design process. The gardener apron design was created through draping technique and revised through fit testing on a range of adult male and female body types. The open-ended responses were inductively coded and the Statistical Package for Social Sciences (SPSS) 19.0 software was used to analyze the descriptive statistics for the quantitative data.

Major functional needs expressed by Master Gardeners were: a) convenient closure without back ties; b) flexible fit provided by shoulder straps that also accommodate various body motions; c) functional pockets and loops to hold tools, water bottle, and cell phone; d) sun protection and modesty when working outside; and e) convenient wash and care. Based on the market survey and a Master Gardener focus group, the design features of the prototype included a gardening gear apron with shoulder straps that are adjustable in length via snaps and accommodate height differences or adapt to a seated rather than bending or kneeling positions. SunTex 90® vinyl coated polyester mesh developed to be resistant to the ultraviolet rays, mildew, and stains was selected as a main material for the prototype. The silhouette falls from the shoulder straps and is

adaptable across a range of unisex sizes. The tools and water bottle pockets have open areas on the bottom to allow dirt to fall through yet the straps with snaps prevent objects from falling out. The entire apron can be cleaned by hosing it off and hanging to dry.

A total of 175 Master Gardeners completed the online survey and reviewed the stimulus that included images of prototype modeled by a male and female gardener in various positions to demonstrate design and functional features. The age ranged from 50 to 86 years with a mean age of 64 years. About 93% of the participants affiliated as White/European American, followed by Hispanic/ Latino (2.4%) and Asian (1.8%). About 92% were female and 66% of the participants were retired. The average gardening experience of the participants was 35 years and about 88% of the participants considered themselves as an experienced gardener. The kind of gardening included flowers, vegetables, fruits, perennials, shrubs, trees, herbs, and berries. When the participants were asked to evaluate the prototypes on a seven-point Likert-type scale, results indicate that the design features of the shoulder straps were perceived to be comfortable to carry the weight of tools and supplies ($m=4.61$, $sd=1.61$) and the base apron mesh fabric with sturdy overall holes was perceived to provide a good ventilation ($m=5.23$, $sd=1.20$). The prototype were also perceived to be convenient for carrying tools ($m= 4.04$, $sd=1.70$) and efficient in having various pockets ($m= 4.3$, $sd=1.55$) and a knee/sitting pad ($m= 4.10$, $sd=1.57$). A significant regression equation was found for the model predicting wearing intention ($F(2,125)=68.99$, $p<.00$) with an R^2 of .52. The two constructs, Perceived Comfort ($\beta=.45$, $t=4.81$, $p<.00$), and Perceived Visual Function ($\beta=.58$, $t=5.11$, $p<.00$), had positive effects on the Master Gardeners' wearing intention. The participants found the prototype to be "*useful and easy to access*" [P85] and found the side pockets, knee pad, and straps especially helpful: "[pockets are] *deep enough so that things won't fall out when bending over*" [P28], "*Great to have knee pads that attach and the apron length lines just right*" [P134]. The participants further suggested to have printed textile that were inspired by gardening such as floral and plants motifs rather than having a solid color: based on the results, the final prototype has been modified to include a print focal point.

The collaborative design process between the users and the researchers resulted in effective development of a functional gardening gear apron beneficial to gardeners. The results confirmed the effectiveness of UCD framework in context of designing functional clothing for baby boomers. Future study may include devising design strategies to encompass specific stages of gardening such as the gathering of fruit and vegetables as well as accessories addressing head and back sun protection.

References

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