DEVELOPING EDUCATIONAL AND OCCUPATIONAL FRAMEWORKS IN THE FLORAL INDUSTRY AND MEASURING CONSUMER PREFERENCES FOR FLOWER FORM AND SPECIES

A Dissertation

by

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ABSTRACT

The floral industry has been facing challenges due to structural changes over the past few decades. Intensifying competition between retail florists and other shopping channels continue to impact the industry, which leads to a significant decline in the employment of floral designers and sales of floral products in retail shops. Across the nation, industry firms and educational institutions have been seeking strategies to cope with these challenges. This research study aims to provide information for the industry and academia to make more informed decisions.

An exhaustive environmental scan was conducted regarding the educational and career pathways and occupational skill qualifications in the floral industry. Based on the information collection and analysis, major educational and career pathway components were identified. Diagrams with the interconnections of all pathway components were created, and education programs of major pathway components were characterized.

The occupational skill qualifications framework included four levels of qualifications of floral designers. The roles and duties of each level were defined. Up to ten competency categories for each level were identified.

A survey study was conducted to evaluate the identified competencies and practicality of the two frameworks by industry professionals and gained insights from them on the suggestions for improvement. The likelihood of using the two frameworks developed showed that a total of 80% and 88% of survey respondents expressed likely or very likely to use these two frameworks, respectively.

Lastly, a consumer research study was conducted that focused on consumers preferences' and willingness to pay for flower form and species. For flower form study, the results indicated that at both low and high price points, consumers placed the highest value in geometric designs. Both parallel design and line flower significantly increased willingness to pay at high price point. For species substitution study, no statistically significant difference was shown in either willingness to pay or beauty rating between expensive and inexpensive species. For individual flower symmetry study, rose was rated the highest on attractiveness, followed by dahlia and ranunculus. Anthurium was rated the lowest. Radial flowers were considered most appealing, bilaterally symmetrical flowers had the lowest beauty rating. The results of this study could potentially assist designers in future business decisions.

DEDICATION

This dissertation is dedicated to my family, grandmothers, mother, father, cousin, sister-in-law, and my boyfriend, for their unconditional love and support in pursuing my dream in my beloved floral design world. Thank you for being there for me.

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Contributors

This work was supervised by a dissertation committee consisting of Professor Dr. Charlie Hall, Dr. Elizabeth (Betsy) Pierson, and Mr. Bill McKinley of the Department of Horticultural Sciences, Dr. Marco Palma of the Department of Agricultural Economics, Dr. Theresa Murphrey of the Department of Agricultural Leadership, Education and Communications, and Dr. Monica Neshyba of the Department of Teaching, Learning and Culture, College of Education and Human Development.

All other work conducted for the dissertation was completed by the student independently.

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CHAPTER I

INTRODUCTION

The floral industry has seen much structural change, both nationally and internationally over the last few decades. Over the past ten years, the differentiation between amateur flower arrangers and professional floral designers has become blurred with more people turning their hobby into a business without receiving necessary training or education to master required skills for a professional floral designer fully. Additionally, the intensifying competition in the floral industry has given consumers more options in choosing a channel from which to purchase flowers, which has led to a decline in the employment of floral designers and the sales of floral products at retail flower shops (IBISWorld Report, 2019). Therefore, there is a compelling need to upgrade the professionalism of floral designers and better understand consumers' preferences and expectations for floral products.

Education is crucial for the floral industry. Preparing youth and adults to enter the workforce and to be able to contribute lifelong endeavors to the industry is critical to the floral industry. Additionally, worldwide, educators and industry leaders have been exploring ways to connect academic learnings with career aspirations, and workforce needs better.

Educational and career pathways and occupational skill qualifications benefit the floral industry in various ways. Individuals who are interested in pursuing a career in the

industry can use the educational and career pathways framework to understand better the options for post-secondary education and training programs, which can prepare them for careers and fulfilling lives. Occupational skill qualifications serve to assist individuals in identifying the knowledge and skills required to perform and succeed in the industry; institutes with education and training programs can use these tools to strengthen programs to improve education outcomes; employers will be able to identify talented potential employees and more precisely evaluate workplace performances; policymakers and leading industry organizations can use these tools to effectively and efficiently generate strategies and allocate resources for strengthening economies.

Currently, there are no published resources regarding an educational and career pathways framework or occupational skill qualifications in the floral industry in the United States. This research study aimed to develop these two frameworks and evaluate the practicality and likelihood of adoption by industry professionals. In addition, to better understand what drives consumers' flower purchases, a marketing research study was conducted to ascertain consumers' preferences and willingness to pay for flower forms and species, which have been playing significant roles in the aesthetic value of floral design. With this information, we are aiming to upgrade the professionalism of floral designers, guide designers in future business decisions, which lead to greater sales, higher profits, and, eventually, increase the competitiveness of the floral industry.

CHAPTER II

DEVELOPING THE EDUCATIONAL AND CAREER PATHWAYS FRAMEWORK IN THE FLORAL INDUSTRY

Background

As reported by the U.S. Bureau of Labor Statistics (BLS), floral designers could see a 14 percent decline in employment during 2018-2028. This decline in the employment opportunities for floral designers is correlated to the decrease in the number of florist shops caused by the growth in the grocery store and supermarket floral departments (Bureau of Labor Statistics, 2019).

Three decades ago, consumers purchased flowers mainly from flower shops. While nowadays, multiple shopping channels are available for floral consumptions, including grocery stores, supermarkets, online shopping sites, or self-educate via online tutorials and do-it-yourself videos (DIY). Grocery stores and general merchandise stores offer floral decorations and loose cut flowers. These channels have made it more convenient and time and cost-effective for consumers to purchase flowers and other floral products. Consumers do not necessarily have to make trips to the flower shops though the aesthetic value of floral products at flower shops may be higher than other shopping channels. Additionally, social media has made it possible for new florists to find customers without having to have brick and mortar stores, which reduces the demand for more shops because the existing ones could already reach a broader range of

consumers. Therefore, retailers must hone design skills or develop marketing strategies to satisfy consumer expectations better, enhance competitiveness, and remain profitable (The Telegraph, 2017).

Education is crucial as experience in the floral industry. In the United States, although entry-level floral design-related positions require a high school diploma or the equivalent, postsecondary training programs are recommended for those who wish to enhance marketability and formally learn how to run a floral business or pursue higher career goals in the floral industry. Programs in floral design are available in private floral schools such as American Institute Floral Designers (AIFD) Education Partner schools, state floral associations, vocational schools, community colleges, and some four-year universities. Academic degrees or professional credentials are needed to become a professional floral designer, floral manager, floral design educator, etc. (Bureau of Labor Statistics, 2019). Although diverse training programs are available for continuing education of floral designs, there is a compelling need to integrate all educational and career pathways into a structural system to serve as a roadmap for designers to achieve various career goals.

Career pathways integrate programs that aim at developing students' core academic, technical and employability skills, prepare them for high-demand and high-opportunity jobs by providing them with necessary and continuous education and training (Workforce Solutions Alamo, 2019).

For individuals who set career goals to become a professional floral designer, a well-designed career pathway system could assist them in identifying a promising field and the routes they could take for their professional development, and thus build necessary competencies to prepare for a well-paying, long-term career. As for employers, a comprehensive educational and career pathway system could provide them with means for high-quality recruitment and training of new employees, upskilling current employees, improving retention, and reducing turnover. For the whole industry, educational and career pathways help maintain sustained growth of the industry, ensures its vitality, and increases the country's international competitiveness (Alssid et al., 2002).

A talented, creative, and motivated workforce is what differentiates the winners from everyone else in the highly competitive marketplace. To date, no framework is available that adequately describes the educational and career pathways in the floral industry in this country (W. McKinley, personal communication, 2018). The objectives of this part of the dissertation study were to identify educational and career pathways in the floral industry in the United States. Diagrams with interconnections of all educational and career pathways in the floral industry were created, and education programs of major pathway components were characterized.

Materials and Methods

Literature, websites, and educational materials on educational and career pathways in the floral industry were searched, reviewed, and synthesized. Six educational and career pathway components were identified as the major components based on this environmental scanning. They included:

1. High school certification program provider,
2. State floral association education provider,
3. American Institute of Floral Designers (AIFD) Education Partner,
4. Higher education programs offering various degrees including Associate of Arts (AA), Associate of Science (AS) and Associate of Applied Science (AAS); bachelor's degrees including Bachelor of Arts (BA) and Bachelor of Science (BS); Master of Science (MS) and Doctor of Philosophy (Ph.D.)),
5. Certified Floral Designer (CFD) designation,
6. American Institute of Floral Designers (AIFD) designation programs.

Information on education and training programs provided by each major educational and career pathway component was collected and summarized. These programs include high school certificate program, state floral association certified florist programs such as certified florist, professional certified florist, and certified master florist programs, American Institute of Floral Designers (AIFD) Education Partner short-

term certification programs, community college certificate programs, community college Associate of Arts (AA), Associate of Science (AS), or Associate of Applied Science (AAS) programs, university Bachelor of Science (BS) or Bachelor of Arts (BA) program, university Master of Science (MS) program, university Doctor of Philosophy (Ph.D.) program, Certified Floral Designer (CFD) program, and American Institute of Floral Designers (AIFD) program. The 1-2-year education programs at community colleges are in floral-related areas or horticulture, while 4-year programs and above at a university are in horticulture or plant science mainly.

Education programs within each pathway component were identified along with the primary knowledge and skills required to gain a certificate or degree to reach the corresponding level. The high school floral certification program provided by Texas State Floral Association was identified and examined in detail. Requirements for this certification program, such as curriculum, written, hands-on tests, and other requirements, were examined. Environmental Scan was conducted for 46 state floral associations among which, 15 state floral associations are currently providing certified florist programs (Table 1).

Table 1 The 46 state floral associations examined for education and training programs.

State floral association education providers
• Alabama State Florists Association
• Alaska State Florists Association
• Arizona State Florists Association
• Arkansas State Florists Association
• California State Florists Association
• Connecticut Florists Associations
• Floral Association of the Rockies
• Florida State Florists Association
• Georgia State Florists Association
• Hawaii Florist Associations
• Idaho State Florists Association
• Illinois State Florists Association
• Indiana State Florists Association
• Iowa Florists' Association
• Kansas Florist Associations
• Kentucky Florist Associations
• Louisiana State Florists Association

Table 1 Continued, state floral association education providers.

- Maine State Florist & Growers Association
- Maryland Florist Associations
- Massachusetts Florist Associations
- Michigan Florist Association
- Minnesota State Florist Association
- Mississippi State Florists Association
- Missouri State Florists Association
- Montana State Florists Association
- Nebraska State Florists Association
- Nevada State Florists Association
- New Hampshire State Florists Association
- New Jersey State Florists Association
- New Mexico State Florists Association
- New York Florist Associations
- North Carolina State Florists Association
- North Dakota State Florists Association
- Ohio Florists Association
- Oklahoma State Florists Association
- Rhode Island Retail Florists Association

Table 1 Continued, state floral association education providers.

- South Carolina Florists Association
- South Dakota Florists Association
- Tennessee State Florists Association
- Texas State Florist Association
- Utah Professional Florists Association
- Vermont Florist Associations
- Virginia State Florists Association
- Washington Florists Associations
- West Virginia Florist Association
- Wisconsin and Upper Michigan Florists Association

AIFD Education Partner schools are floral design schools that provide short-term classes and certification programs for all levels of designers. Thirty-six current AIFD Education Partner schools were investigated in this study. The source of AIFD Education Partner floral design schools is originated from the AIFD official website (American Institute of Floral Designers, 2018).

Certification programs in floral design or relevant subjects at community colleges were examined based on Careers in Floriculture: Catalog of Schools by Society of American Florists (2016). The duration of programs, curriculum, knowledge, skills,

and credit hours required were investigated.

Higher education degree programs (AA, AS or AAS, BA or BS, MS, Ph.D.) in Floral Design, Floriculture, and Horticulture at community college or university were investigated based on Careers in Floriculture: Catalog of Schools by Society of American Florists (2016). Fifty-six 1 to 2-year programs and 42 4-year programs were examined. The duration of programs, required credit hours, and curriculum requirements for the degrees were examined. For horticulture or floriculture programs, the percentages of floral design-related classes were recorded, and the average percentage of floral design classes provided in each program was calculated.

Certified Floral Design (CFD) and the American Institute of Floral Designers (AIFD) are internationally recognized credentials. Required knowledge, skills, tests, and various pathways to obtain these credentials were investigated.

Base on the information collected and synthesized, diagrams showcasing the interconnections of major educational and career pathway components were created.

Results

Educational and career pathway diagrams

Four educational and career pathway diagrams were created (Figure 1-4), an overview diagram (Figure 1) and three diagrams focus on higher education, AIFD Education Partners, and state floral association, respectively (Figure 2-4).

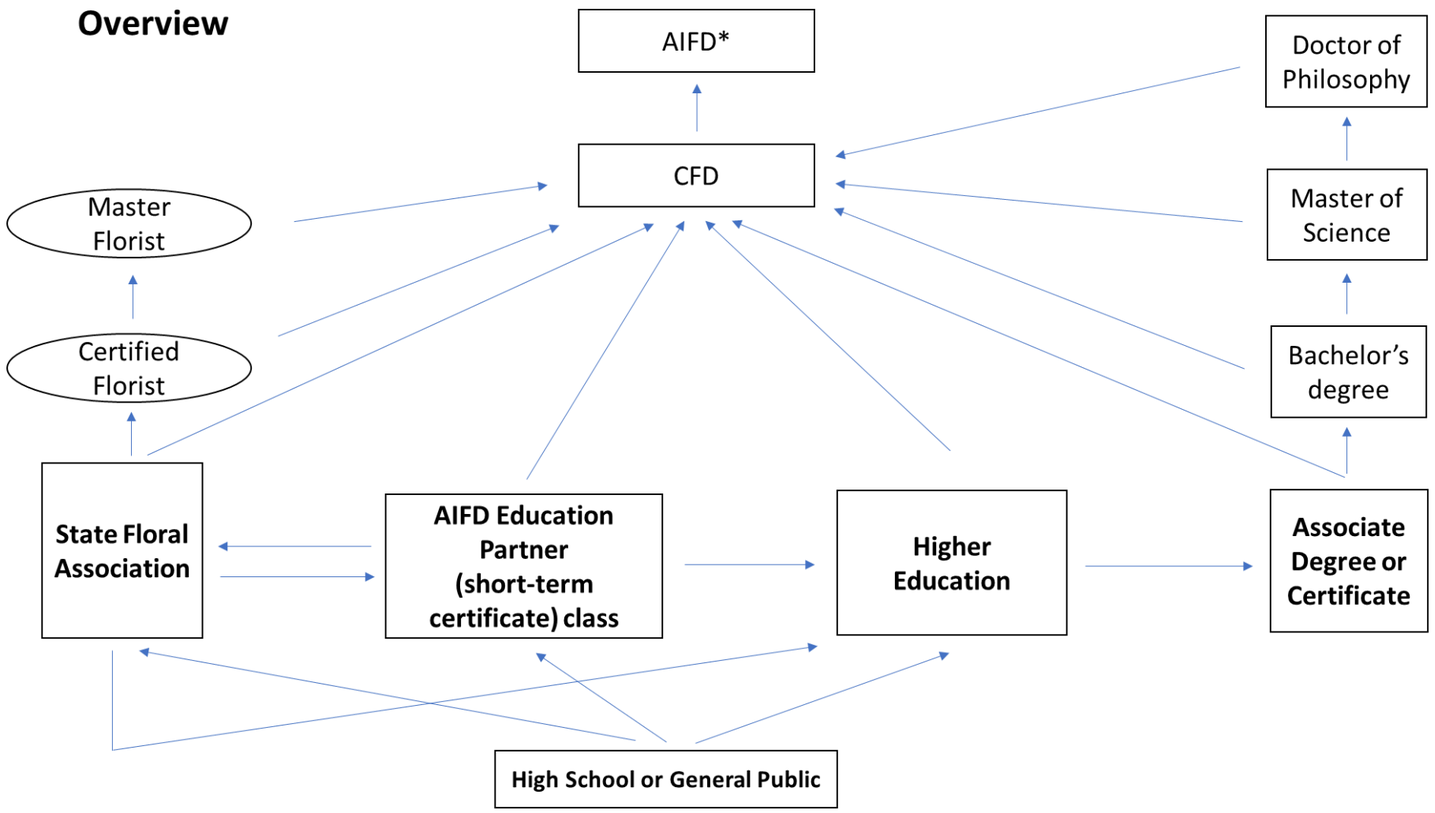


Figure 1 Overview diagram with interconnections of all educational and career pathway components.

Entry-level positions require a high school diploma or the equivalent. Postsecondary training/education programs are provided by state floral associations, AIFD Education Partners, and Higher Education Institutes. CFD could be achieved by completing the appropriate educational programs provided by an AIFD Education Partner, approved state floral association, Student American Institute of Floral Designers (SAIFD) Chapter, or during any stage of higher education. AIFD can only be obtained by achieving the required scores in the Professional Floral Design Evaluation (PFDE). A person from the general public follows the same pathways as those who start after high school.

***** AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.

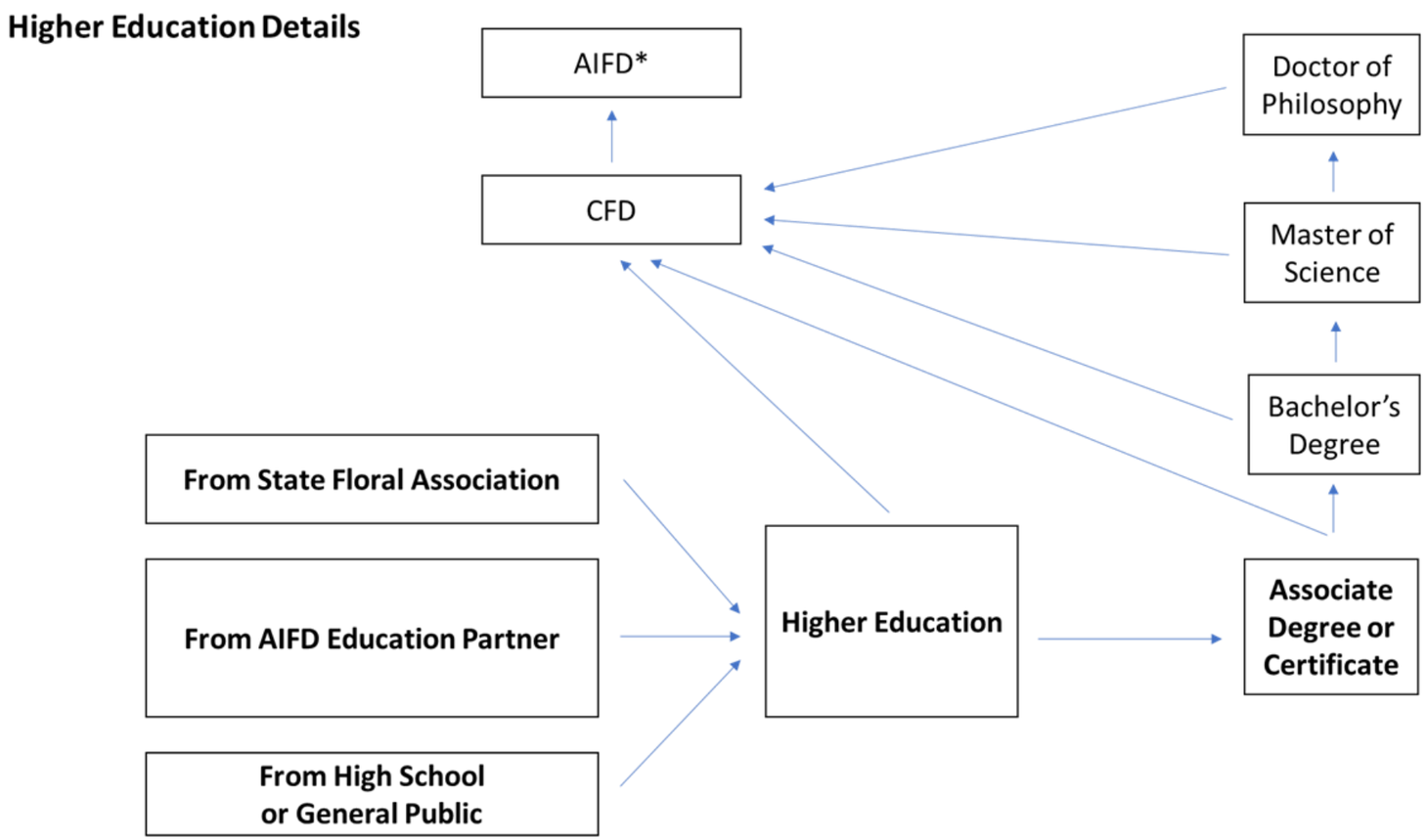


Figure 2 Diagram with detailed connections between higher education and other pathway components.

The diagram shows detailed connections between higher education and other pathway components. People who enter higher education institutions could be recent high school graduates, persons from the general public, or have a certification program background from a state floral association (e.g., Texas State Floral Association provides high school certification programs.) or AIFD Education Partners. CFD and AIFD could be achieved during any stage of higher education.

***** AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.

AIFD Partner Details

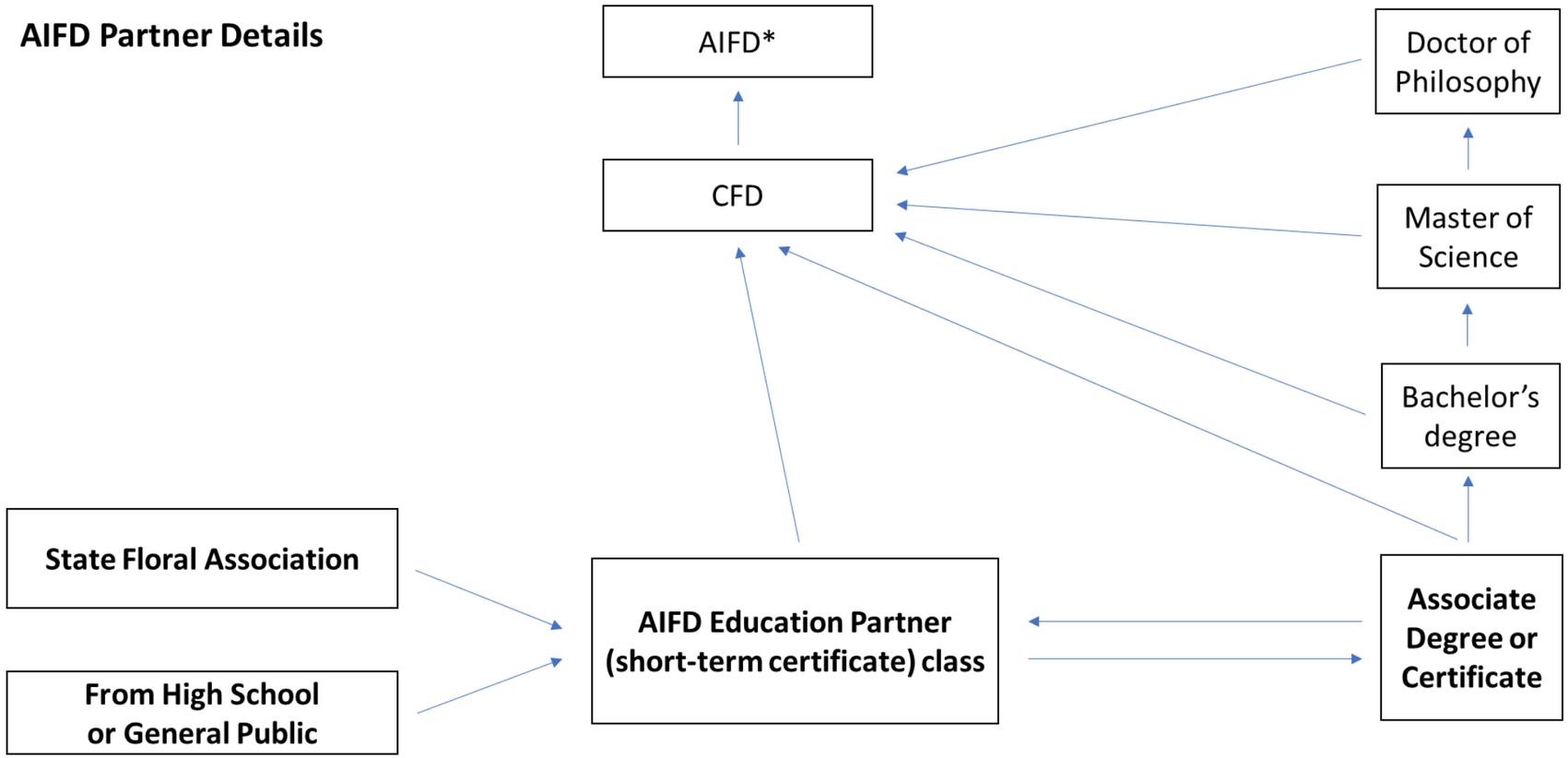


Figure 3 Diagram centers on AIFD Education Partner Schools.

People who go through educational programs offered by AIFD Education Partners can come from high school or the general public, and/or could have obtained certifications from state floral associations. CFD and AIFD could also be achieved during any stage of higher education.

***** AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.

State Floral Association Details

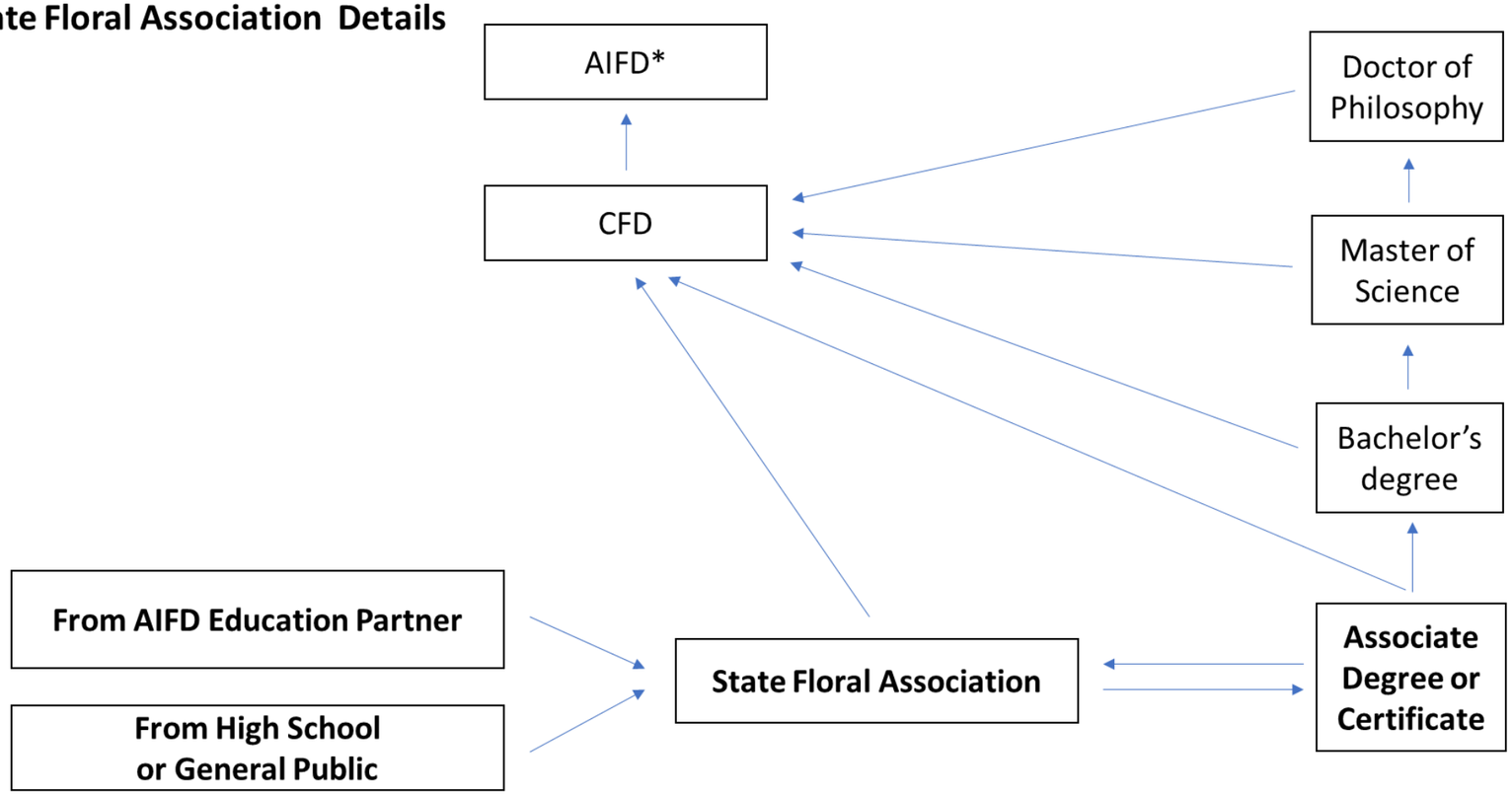


Figure 4 Diagram focuses on connections between state floral associations and other pathway components.

People who attend education/training programs offered by state floral associations could be high school graduates or from the general public, and/or have a certification from an AIFD Education Partner. CFD and AIFD could also be achieved during any stage of higher education.

***** AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.

Summary of education programs of major pathway components

High school certificate program

The Texas State Floral Association (TSFA) provides a high school certificate program (Texas State Florists' Association, 2017). This program aims at preparing young floral designers to accommodate the needs of retail florists. There are two levels of certification in this program. Requirements for level 1 certification include completing a year-long curriculum approved by Texas Education Agency, passing a written exam and a hands-on design test which includes two floral designs in a timed setting.

Requirements for level 2 certification include a design portfolio with assigned designs, two volunteer experience, or sharing of floral skill from the following events:

- at level 1 test site
- community event sharing flowers
- regional design show
- attend hands-on floral workshop
- test with floral design teacher to confirm the ability to make a triangle design
- additional events if approved by TSFA

Additionally, students need to pass a hands-on design test, which includes three design pieces. Upon completion of this program, students are well-prepared for an entry-level position in a flower shop (Texas State Florists' Association, 2017).

State floral association education programs

Currently, 15 state floral associations provide the certified florist programs. Among which, 13 are AIFD approved state floral association education providers, which may also qualify students to earn AIFD's CFD credential upon completion of certified florist programs (American Institute of Floral Designers, 2018). The most common certification programs at these associations are certified florist program and master florist program. Requirements for obtaining certification include taking online and/or hands-on classes, attending hands-on workshops, passing written exams, and hands-on design tests. Some programs require an academic degree, industry experience, or certain years of floral design experience (Table 2).

Table 2 Certification programs provided by state floral associations.

Texas	**Texas Master Certified Florist (TMF)**	**Texas Master Florist Advanced (TMFA)**	**Professional Certified Florist (PCF)**
	• Texas State Florists' Association (TSFA) Education Application (Wedding Bouquet; Standing Easel Spray; Wired and Taped Corsage; Vase Arrangement; Basket Arrangement; Asymmetrical Arrangement) • Qualifying Exam (Symmetrical Triangle; Asymmetrical Triangle; Oblong Design; Round Design; Corsage) • 7 online courses (Floral Business Procedures and Policies; Care and Handling of Foliage and Flowering Plants; Care of Cut Flowers & Foliage; Floral Sales, Profitability; Flower Shop Delivery Concepts; The Art of Effective Visual Merchandising; Advertising and Marketing) • 3 hands-on courses (Celebration of Life, Sympathy Design; Wedding Design Styles & Techniques;	• Attend courses in 4 of 12 TSFA-approved topics • Attend 4 TSFA Convention approved hands-on workshops • Earn 1 credit per class • You have 4 years to obtain 8 total required credits	• Complete TSFA Education Application • 7 online courses (same as TMF's courses) • 3 hands-on courses (same as TMF's courses) • PCF Final exam

Table 2 Continued, certification programs provided by state floral associations.

Texas	The Elements & Principles of Floral Design) • TMF Final Exam	N/A	N/A
Arizona	**Arizona Master Florist (AzMF)**	N/A	N/A
	• Complete 12 classes (Principles of Design; Care & Handling of Foliage & Flowering Plants; Customer Relations; Delivery; Merchandising; Employee Relations; Advertising & Promotions; Daily Business Procedures; Basic Design Techniques; Wedding Techniques; Funeral Techniques; Care & Handling of Cut Flowers & Foliage) • Pass Final Exam	N/A	N/A
Arkansas	**Arkansas Master Florist (AMF)**	N/A	N/A
	• Complete classes and pass exams (Principles and Elements of Design; Care and Handling of Fresh Cuts and Plants; Flowers to wear; Management: Marketing; Advertising and Promotion; Management: Merchandising; Management: Customer	N/A	N/A

Table 2 Continued, certification programs provided by state floral associations.

Arkansas	Relations, Employee Relations; Hands-on Wedding Bouquets; Hands-on "Celebration of Life" with an Emphasis on Sympathy; Management: Delivery; History of Design Styles: Everyday) • Written and Hands-on tests (Flowers to wear; Wedding Bouquets; Everyday, Sympathy, Copy)	N/A	N/A
California	**California Certified Florist (CCF)**	N/A	N/A
	• Written Exam (Flower ID; Flower and Plant Care and Handling; Floral Design [Design elements and principles; Color and light in floral design; Floral design concepts and styles; Considering the container; Techniques and Mechanics]) • Hands-on Design Test (Flowers to wear; Sympathy Arrangement: Standing Spray; Hand-tied Bouquet: Wedding Design; Designer's Choice; Duplication Design)	N/A	N/A
Georgia	**Georgia Master Florist (GMF)**	N/A	N/A
	• Complete and pass 9 online classes	N/A	N/A

Table 2 Continued, certification programs provided by state floral associations.

Georgia	(Principles of Design; Concepts of the Care and Handling of Foliage and Flowering Plants; Care and Handling of Cut Flowers and Foliage; Customer Relations; Delivery Made Simple; The Art of Effective Visual Merchandising; Employee Relations; Advertising and Promotion; Daily Business Procedures) • Complete and pass a hands-on class and exam • Complete and pass a design evaluation session	N/A	N/A
Maine	**Professional Certified Florist (PCF)**	**Maine Master Floral Design Program (MMFD)**	N/A
	• Take 12 classes and pass an exam: *Design Classes* (Elements of Design; Basic Principles of Design; Care & Handling of Cut Flowers & Foliage; Care & Handling of Flowering Plants; Wedding Design; Sympathy Design) *Management Classes* (Customer Relations; Employee Relations; Delivery; Merchandising;	• Good standing of Maine State Florists and Growers Association (MSFGA) or an employee of a member shop in good standing. AND • Have passed MSFGA's Professional Certified Florist (PCF) program within 5 years	N/A

Table 2 Continued, certification programs provided by state floral associations.

Maine	Advertising and Promotion; Basic Business Procedures) • Take certification test	• exposure to floral design. OR • A comparable or advanced course of study such as AIFD, college degree in retail floriculture or equivalent and 3 years exposure to floral design. OR 5 years full time design experience. (Students must be able to show proof of design experience). All eligibility for enrollment will be up to the MSFGA Education Chairman and Instructor.	N/A
South Dakota	**South Dakota Certified Florist Program (SDCF)**	N/A	N/A
	• Written and practical application test	N/A	N/A
Florida	**Florida Professional Certified Florists (FPCF)**	**Florida State Master Designer (FSMD)**	
	• No info on how to achieve FPCF on the official website	• No info on how to achieve FSMD on the official website	N/A
North Carolina	**North Carolina Certified Professional Florist (NCCPF)**	N/A	N/A
	• 9 online classes on shop	N/A	N/A

Table 2 Continued, certification programs provided by state floral associations.

North Carolina	operation (Flower Shop Delivery Concepts; Care and Handling of Cut Flowers and Foliage; Advertising, Promotions, Marketing, and Public Relations; The Art of Effective Visual Merchandising; The Principles of Design; Employee Relations; Customer Relations; Concepts of Care and Handling of Foliage and Flowering Plants; Daily business procedures) • 3 hands-on classes (Current Design and Techniques; Sympathy Design and Techniques; Wedding Design and Techniques) • Final exam	N/A	N/A
Illinois	**Illinois Certified Professional Florist (ICPF)**	**Illinois Certified Designer (ICD)**	N/A
	• 9 Online Classes (Concepts of the Care & Handling of Foliage and Flowering Plants; Care & Handling of Cut Flowers and Foliage; Customer Relations; Flower Shop Delivery Concepts; The Art of Effective Visual Merchandising; Advertising and Promotion; Employee	• Complete the appropriate floral design education programs through ISFA including ICPF and the Continuing Education Bootcamps	N/A

Table 2 Continued, certification programs provided by state floral associations.

	Relations; Daily Business Procedures; Principles and Elements of Design) • 4 Hands-on Classes (Everyday Basic Design; Design Techniques and Applications; Wedding Design Techniques; Sympathy Design Basics) • Comprehensive Assessment (Written + Design)		
Kentucky	**Kentucky Master Florist (KMF)**	N/A	N/A
	No info found on how to achieve KMF	N/A	N/A
Louisiana	**Certified Florist (CF)**	N/A	N/A
	No info found on how to achieve CF on the official website	N/A	N/A
Michigan	**Certified Florist (CF)**	N/A	N/A
	• Written test + Hands-on test	N/A	N/A
Rockies	**Certified Professional Florist (CPF)**	N/A	N/A
	• No info found regarding how to achieve CPF on the official website		
Wisconsin and Upper Michigan	**Certified Florist (CF)**	N/A	N/A

Table 2 Continued, certification programs provided by state floral associations.

Wisconsin and Upper Michigan	• 9 Online Classes • 3 Hands-on Classes • Final Exam (Written + Hands-on)	N/A	N/A

AIFD Education Partner floral design schools

Approved AIFD Education Partners provide a wide range of floral design classes and programs for career development, helping prepare students from beginners to professionals for successful careers in the floral industry. Classes/programs could be categorized by different reasons for taking classes (e.g., interest/hobby vs. professional/certification). Professional or certification programs could be further classified by various levels (basic, intermediate, advanced, capstone), types of specialty classes (wedding design, sympathy design, holiday design, corporate design, floral jewelry design, etc.), CFD and AIFD prep classes, international design styles (Asian, European, etc.), and other courses which do not fit in any of the above categories.

AIFD Education Partner schools may provide both interest/hobby classes for floral design amateurs and professional or certification classes targeting those who are interested in pursuing a career in the floral industry. Interest classes include, but are not limited to daily life floral design, holiday design workshop, lifestyle aesthetics, basic botany, bouquet class, European design, etc.

AIFD Education Partner schools provide various levels of floral design training and education programs, including basic (fundamental), intermediate, and advanced floral design programs. Some also have “capstone” programs that serve as the highest-level program. The duration of each level program is from 8 hours to 160 hours. Upon completion of classes, schools may award students Certificate of Completion, Continuing Education Certificate, Certified Floral Designer, or Basic/Intermediate/Advanced/Capstone Floral Design Certificate bearing the names of the corresponding schools. Some schools require passing written and hands-on exams to be awarded the certificate. Classes of these programs include but not limited to: floral supplies, tools and containers, care and handling of fresh flowers, elements and principles of floral design, color theory, flower and foliage ID, design for various occasions such as everyday design, holiday design, church design, wedding design, sympathy tributes, etc., various design styles including geometric design, pavé design, parallel design, vegetative design, Asian inspired (including Ikebana) design, European design, design techniques and mechanics, wedding consultation, floral jewelry, bouquet design, retail flower shop operation and management, floral sculpture, permanent botanical design, large-scale floral installation. Some programs also include field trips to wholesale flower markets, fresh flower wholesalers, and/or hard goods wholesalers.

Specialty classes could be further classified by occasions, techniques, and others. Floral design classes for various special occasions include, but are not limited to:

sympathy, wedding, party and event, wedding and event consultation, body and fashion floral designs, hotel lobby and corporate designs, holiday designs, large-scale floral installation, etc. Floral design techniques classes include but not limited to contemporary techniques, wiring techniques, creative foliage manipulation. Other courses include color theory and application, floral photography, professional floral sketching, etc.

AIFD Education Partner schools provide prep classes for internationally recognized designations CFD and AIFD. The test for getting inducted into AIFD is named “Professional Floral Design Evaluation (PFDE)”. These prep classes are taught by the accredited members of AIFD, mainly focus on design elements and principles, applications (mechanics and techniques), design styles, floral jewelry and design for special occasions such as wedding and sympathy, based on the book “The AIFD Guide to floral design (terms, techniques, and tradition)”. Partner schools may provide both mandatory core classes, and elective classes and PFDE class may be called differently, such as AIFD Primer. Some AIFD Education Partner schools also provide PFDE mock exams targeting those who wish to participate in the upcoming PFDE test. These mock exams follow the same guidelines as PFDE, which is held once a year at the national AIFD symposium in the United States. Students are given five design categories, including duplicate, wedding, sympathy, flower to wear, and arrangement to complete within four hours’ time limit.

Some AIFD Education Partner schools outside the US provide international

floral design professional/certification programs such as Dutch Floral Arranger (DFA), Advanced DFA, Ikebana. Judith Blacklock Flower School in the UK has professional business courses that award students a diploma issued by Judith Blacklock Flower School upon completion.

Other classes provided by AIFD Education Partner schools include fresh flower care and handling, Flower ID, merchandising for retail flower shops, floral marketing, sales and service, dried and preserved flowers, permanent flowers, hand-tied bouquet class, industry terminology, tools of the trade, customer care, floral business management, career in the floral industry, etc.

Higher education programs

The Floral Design Certificate of Achievement (CA) program at a community college or university lasts from one to two years, with credit hours ranging widely from 12 to 50. Various classes are provided in these programs. Two-year programs that have floral design courses could lead to an Associate of Arts (AA), Associate of Science (AS) or Associate of Applied Science (AAS) degree in Floral Design (or related such as Floral Management, etc.), or a degree in Horticulture if floral design classes only make a small portion of the curriculum in the program. An associate degree program in Floral Design related area prepares students for working in the floral industry. Courses offered in these programs are similar to those available in the one or two-year certificate programs. The

credit hours of these programs range from 18 to 66. For an associate degree in Horticulture or Plant Science, the percentage of floral design classes in these programs takes up 5%-30%.

Colleges or universities have three- or four-year BA or BS degree programs with a floral design (related) concentration or offer undergraduate level floral design classes in the Department of Horticulture (or Crop Science, Plant Science, Landscape, etc.). One to seven floral design-related courses are offered in these programs, most of which are two or three credit hours each. Within these degree programs, universities such as Texas A&M University in College Station and Kansas State University provide graduate students the opportunity of researching floral design-related areas for thesis or dissertation. Mississippi State University offers a minor in Floral Management of the Plant and Soil Sciences degree for graduate students who seek training in this field to complement their graduate degree.

Certified Floral Designer (CFD)

There are three ways to become an internationally recognized Certified Floral Designer (CFD). The first way is to attend and complete the appropriate floral design education programs (courses and hands-on evaluation deeming the participants' design work worthy of the CFD designation) at an AIFD Education Partner, approved state floral association, SAIFD Chapter. Individual names and contact information will be

submitted to AIFD headquarters who, in turn, will send an invitation to take the PFDE online test and receive an 80% or above.

The second way is to participate in the same Professional Floral Design Evaluation (PFDE) as those trying to obtain their AIFD designation, held once annually, including the online test and hands-on design evaluation. The third way is to participate and earn an average score of 7.0 for all designs with no design lower than 6.5 in the SAIFD Student Competition at the symposium. Those who meet the minimum requirement can be recommended for CFD to AIFD. Upon the successful completion of any of these options, candidates will be awarded the CFD designation.

American Institute of Floral Designers (AIFD)

There is only one way to become an Accredited Member of AIFD: participate in the Professional Floral Design Evaluation (PFDE) and achieve scores at the level required to receive an invitation for membership.

Discussion and Conclusions

Education and experience are crucial requisites for success in the floral industry. In the United States, although entry-level floral design-related positions only require a high school diploma or the equivalent, postsecondary training programs are recommended for those who want to develop a long-term career in the floral industry.

According to the Bureau of Labor Statistics (2018), those with formal education in floral design will have better career prospects. Across the nation, educators and industry leaders have been exploring ways to connect academic learnings with career aspirations and workforce needs better.

The educational and career pathways framework involves an integrated collection of programs and services, which intends to assist individuals in developing individuals' core academic, technical and employability skills, provide them with means for continuous education, training for long-term career development and place them in high-demand, high-opportunity jobs.

The development of the educational and career pathways framework was based on identifying, researching, and synthesizing educational and training programs provided by all pathway component entities in the United States, which are key stakeholders in academia and industry. Therefore, the innovative framework was tailored to fit the floral industry in the United States. For individuals who set career goals to become a professional floral designer, the well-designed career pathways framework could serve as a roadmap to assist in identifying a promising field, preparing youth and adults to enter the workforce and building necessary competencies for long-term career development. For employers, the comprehensive educational and career pathways framework could provide them with means for high-quality recruitment and training of new employees, upskilling current employees, improving retention, and reducing

turnover. For the whole industry, the educational and career pathways framework helps maintain sustained growth of the industry, ensures its vitality by attracting new talented youth and adults to enter the industry, and increases the country's international competitiveness.

Following the development of the framework, the next step of the research study was to survey to evaluate the practicality of the framework and the likelihood of using the framework by industry professionals, the Accredited Members of the American Institute of Floral Designers (AIFD). AIFD is the floral industry's leading non-profit organization dedicated to establishing, maintaining, and recognizing the highest standard of professional floral design (American Institute of Floral Designers, 2019). Members of AIFD are involved in all segments of the industry, who are opinion leaders in the industry. The survey allowed a variety of stakeholders to provide feedback in a short time frame; this was valuable as the data represented intended stakeholders.

CHAPTER III

DEVELOPING THE OCCUPATIONAL SKILL QUALIFICATIONS FRAMEWORK IN THE FLORAL INDUSTRY

Background

The floral industry makes up about 1.8 billion dollars in global annual sales, with the largest buying periods being Valentine's Day, International Women's Day, and Mother's Day. The United States is the largest consumer of cut flowers in the world. Consumer trends indicate 34 percent of consumers buy fresh flowers. Sales of floriculture items at all retail outlets were 35.2 billion in 2017 (Society of American Florists, 2019).

The vibrant floral industry injects color into our daily lives in the form of surprises on special occasions, floral gifts on Mother's Day, Valentine's Day, floral decorations for weddings, Christmas, birthday parties, etc. A career in the floral industry has become aspirational and attractive. The floral industry has seen much structural change both nationally and internationally over the last decades, which calls for strategies to cope with intensified competition and growing demand for professionally skilled floral designers (Yue and Behe, 2008).

Preparing youth and adults to enter the workforce and to be able to contribute lifelong endeavors to the industry is critical to the floral industry. There is a growing interest in establishing national and state-level industry-driven skill standards in the

floral industry in the United States. As U.S. involvement in international competitions increases, there is a greater need to increase the skills and productivity of the front-line workforce (Illinois State Board of Education, 2000).

Literature Review

Contemporary floral industry and the leading continent in design styles

New design styles continuously emerge and achieve prominence in the floral industry. At the same time, this industry is becoming a much more integral part of modern design, which is inspired by architecture, industrial design, interior design, fashion design, and art.

Worldwide, each main continent has its distinct style, and Europe seems to be a major focus of attention during the past forty years. One of the main reasons is that Europe has relatively higher occupational standards that emphasize professional training (Pryke, 2006). In Europe, if someone wanted to start a floral business, formal training and an apprenticeship would be required. It's quite common to find an accredited Master Florist who earned this title through being a strict full-time student of the floral industry and trained by another professional florist before he/she could own his/her own business. Due to the competitiveness of the floral industry, it is unlikely to find someone operating a floral business and calling him/herself a florist without receiving formal education or training in Europe (Pryke, 2006).

However, in other parts of the world, such as the United States, there are no occupational skill qualifications required to own a flower shop. Anyone can start a floral business before being fully aware of the gap between being an amateur and a professional floral designer. As a result, the distinction between the amateur side of floral arranging and floral art has blurred. The industry has mushroomed with the rapid growth of floral departments in supermarkets, grocery stores, and online flower shopping sites, which has furthered the competitiveness of the industry (Pryke, 2006; Yue and Behe, 2008).

Selected occupational skills qualifications in other countries

United Kingdom: City & Guilds Group

City & Guilds is the UK's leading provider of vocational qualifications, offering over 500 awards across a wide range of industries, and progressing from entry-level to the highest levels of professional achievement. With over 8500 centers in 100 countries, City & Guilds is recognized by employers worldwide for providing qualifications that offer proof of the skills they need to get the job done. Issued in 2015, City & Guilds offers five types of qualifications in floristry supported by the British Florist Association (City & Guilds, 2019):

- Award in Floristry
- Certificate in Floristry

- Diploma in Floristry
- Higher Diploma in Floristry
- Master Diploma in Professional Floristry

There are two levels, six qualifications in total available for an Award, Certificate or Diploma in Floristry: Level 2 Award in Floristry, Level 2 Certificate in Floristry, Level 2 Diploma in Floristry, Level 3 Award in Floristry, Level 3 Certificate in Floristry, and Level 3 Diploma in Floristry. There are two qualifications available in the category of Higher Diploma in Professional Floristry: Level 4 Higher Diploma in Floristry and Level 5 Master Diploma in Professional Floristry (City & Guilds, 2019).

The qualification framework contains the structure of the qualification, for whom a certain level qualification is designed, entry requirements, what career can it lead to, rules for achieving the qualification, which includes required units and their corresponding credit hours. Required completion credit hours increase from award to certificate, to diploma (for example, award 15 credit hours, certificate 30 credit hours, and diploma 90 credit hours). Candidates must complete required units by taking courses to accumulate credit hours. Once candidates reach the required credit hours for a certain qualification and pass the corresponding assessment tests, the qualification can then be achieved. The qualification framework also contains assessment strategy, assessment methods, requirements, levels of assessment criteria including pass, merit, and

distinction, qualification approval, registration, and certification processes (City & Guilds, 2019).

Finland: Finnish National Board of Education

Issued in 2010, the qualification is titled "Vocational Qualification in Horticulture — Specialization in Floristry and Horticultural Business." The other two specializations of this qualification are Horticulture and Landscape industries. The Floristry and Horticultural Business specialization was the focus of this study (Vocational Qualification in Horticulture, 2010).

The qualification framework states the objectives set for the qualification and specialization, structure of qualification, module-specific skills requirements, targets of assessment and assessment criteria for core subjects (Language, Mathematics, Physics and Chemistry, Social, business and labor -market subjects, Physical education, Health education, Arts and culture) as well as ways of demonstrating vocational skills in the case of vocational study modules. The requirements of vocational qualification modules and the objectives of core subjects are defined as learning outcomes (knowledge, skills, competence). The qualification contains both compulsory and optional modules (Vocational Qualification in Horticulture, 2010).

There are no formal qualification requirements for completing this qualification. The qualification may be completed irrespective of how the vocational skills and

competences have been obtained. This qualification is obtained in competence tests by demonstrating the vocational skills in the requirements. The assessment for required competencies comprises three levels: satisfactory, good, and excellent. Upon completion, the qualification certificate will be awarded by the Qualification Committee appointed by the Finnish National Board of Education and can work at florist shops as employees or as independent entrepreneurs (Vocational Qualification in Horticulture, 2010).

India: National Occupational Qualification - Florist

The Agriculture Skill Council of India (ASCI) issued National Occupational Qualifications for florists in 2016 in collaboration with National Skill Development Corporation (NSDC) (National Skill Development Corporation India, 2019). The qualification is comprised of a set of occupational standards, together with the educational, training, and other criteria required to perform a job role as a florist. The minimum job entry age is 16 years old, with preferably 0-1 years in floral design. The qualification pack provides detailed information on compulsory national occupational standard units. There's no optional unit. For each compulsory unit, the following information is provided (National Skill Development Corporation India, 2019):

- Unit title (task);
- General description of the specific occupational standard unit;
- Scope of the standard unit;

- Performance criteria for the scope which are statements that together specify the standard of performance required when carrying out a task;
- Knowledge and understanding including organizational context (knowledge of the company/organization) and its processes, and technical knowledge;
- Skills such as core/generic skills, including writing, reading and oral communication skills, etc., and professional skills, including problem-solving, decision making, critical thinking.

Singapore: Workforce Skills Qualifications

The Floristry Workforce Skills Qualifications (WSQ) is a national skills training system developed by the Singapore Workforce Development Agency (WDA) and the floristry industry (Singapore Workforce Skills Qualifications, 2019). This framework maps out the skills needed for a floristry-related occupation and the training required for the occupation. There are four qualifications, each comprising of compulsory and optional units under the Floristry WSQ suitable for different levels of floristry workers. There are no academic requirements to be trained in any of the units under the Floristry WSQ. However, certain levels of literacy and numeric ability are necessary for the training. After completing each training unit and passing the assessment, the industry practitioner will be awarded a Statement of Attainment (SOA). Accumulation of the

required number of SOAs will lead to WSQ qualification. The 4 Workforce Skills Qualifications are (Singapore Workforce Skills Qualifications, 2019):

- Floral Designer, Floral Manager (WSQ Diploma in Floristry Management)
- Floral Supervisor, Senior Florist (WSQ Advanced Certificate in Floristry Supervision)
- Florist (WSQ Higher Certificate in Floristry Operations)
- Floral Assistant (WSQ Certificate in Floristry Operations)

Materials and Methods

This multi-faceted research study was aimed at (1) identifying gaps between the skills needed to succeed in today's floral industry in the United States and the knowledge that is gained through education and training programs; (2) establishing skill profiles by examining floral industry skill qualifications in other countries around the world; and (3) developing a skill upgrading system that will positively influence the perceptions of professionalism of the floral industry along with the career pathways system established in the previous chapter. We identified what industry practitioners need to know and learn to be qualified for basic-to-master level floral designers. These voluntary skill standards can be used by floral design employees, employers, educators, floral associations to communicate expectations for skills, evaluate individual designers' skills, or the success of education and training programs teaching those skills. These

standards will also promote a lifelong learning process and training investment, raise workforce skills for this creative and dynamic industry, and increase our nation's international competitiveness.

In this study, literature and websites on occupational skill qualifications in the floral industry of other countries were searched, reviewed, and synthesized. Countries that have floral industry occupational skill qualifications were identified, along with organizations in each country that have established occupational standards. Types of qualifications such as award, certificate, diploma were examined. Requirements for achieving the qualifications were also investigated.

Based on the information collected, a framework of occupational skill qualifications in the floral industry of the United States was developed. The framework includes four levels of qualifications of floral designers with the potential job title of each level along the educational and career pathways to reach each level. Roles and duties, including knowledge and skill level, task, problem-solving skills, and autonomy of work of each level floral designer, were defined. A total of ten competency categories of each level floral designer were identified. Knowledge and skills needed for each category at each level of qualification were summarized. The ten competency categories include horticultural sciences, floristry practices, floral design skills, design skills, customer services, business skills, support services, event planning and designing skills, education and training, and professional presentation skills. The definitions of the ten

competency categories are as follows:

Horticultural Sciences

Knowledge about growth requirements, properties, growth habits, and limitations of plant use. Identify botanical materials for appropriate uses in floral design. Know what flowers are in season and when they will be available (i.e., geotropism, phototropism, the toxicity of plants, and appropriate uses of them in the floral arrangement).

Floristry Practices

Knowledge and skills required for care and handling of floral and plant materials. How to sustain and care for maximize longevity (i.e., care, handling, and storage of fresh botanical materials. Maintenance of plant materials in displays).

Floral Design Skills

Application of design elements, principles, and techniques used in the creation of floral arrangements (i.e., apply elements and principles of floral design in the creation of floral arrangements).

Design Skills

Artistic skills, application of design elements and principles in other forms of art, drawing, sketching and artistic presentation skills, photography skills, portfolio design

skills, website design skills, etc. (i.e., recognize the characteristics of general aesthetics, apply design concepts of other forms of design such as architecture, fashion design into floral design).

Customer Services

Taking care of the customer's needs by providing and delivering professional, high-quality designs and services, handling customer complaints, etc. (i.e., merchandise products and services, manage sales, process online and phone call orders, handle consumer complaints).

Event Planning and Designing Skills

Planning, coordinating, and designing for special occasions or events. Create floral designs for appropriate themes, occasions, and events. Event management practices.

Business Skills

Knowledge and skills for operating and managing the floral business (i.e., develop and implement business strategies, flower shop management, marketing floral products, and services, etc.).

Professional Presentation Skills

Effective presentation and communication skills for large-scale floral showcases such as conventions, symposiums, and trade shows.

Education and Training

Provide workplace education and training for employees.

Support Services

Skills for supporting the successful operation and management of a floral business.

Results

Roles and duties of basic-to-master level floral designers

The occupational skill qualifications framework is based on four levels, and each represents a different educational and career development stage and the related competencies that a practitioner should possess at this stage (Table 3). Potential job titles of these four levels are floral design assistant, floral designer, senior floral designer, and master floral designer. Role, knowledge and skill level, tasks/work, problem-solving skills, the autonomy of work of each qualification are defined in Table 3.

Table 3 Roles and duties of floral design-related professions.

	Role	Knowledge & Skill level	Tasks/Work	Problem Solving Skills	Autonomy of work
Floral Design Assistant	This qualification reflects the role of floral design assistants who conduct simple tasks and create pre-determined designs.	They have basic general knowledge of floral design and limited range of basic floristry skills.	These individuals carry out mainly routine and repetitive tasks with limited and basic floral industry knowledge, skills and tools.	They could solve routine problems using simple methods and tools.	They work under direct supervision in a structured context.
Floral Designer	This qualification reflects the role of floral designers who use well-developed skills to design and sell a variety of floral products.	They have good knowledge, understanding, and skills of design elements, principles, techniques and their applications.	They take responsibility for completion of general tasks, they may also provide technical advice and support team members for improvement of the work.	They could solve problems by selecting and applying basic methods and tools.	They work with some independence and under limited supervision.
Senior Floral Designer	This qualification reflects the role of skilled senior floral designers who apply highly developed skills and creativity to design and sell a wide variety of high-style floral products.	They have comprehensive knowledge, skills of design techniques and deep understanding of elements and principles and their applications.	They take a lead role in coordinating the day-to-day operational, decision making processes and business activities.	They can solve unpredictable problems, manage complex technical or professional issues. They could develop creative solutions to difficulties.	They work independently and many floral designers at this level have supervisory responsibilities to plan, monitor and evaluate the work of team members. They also mentor and manage professional development of individuals and groups.

Table 3 Continued, roles and duties of floral design-related professions.

Master Floral Designer	This qualification reflects the role of highly skilled master designers who are capable of using specialized technical, conceptual skills, and innovative creativity to design and sell a diverse range of complex, high-style or themed floral products.	These designers have substantial depth of knowledge and the most advanced skills of design techniques and great execution of design elements and principles. They have critical awareness of trends in different fields.	They demonstrate substantial authority, innovation, and professional integrity and sustained commitment to the development of new ideas, products, techniques and trends at the forefront of the industry.	They could solve critical problems, integrate, extend and redefine existing knowledge or professional practice.	They work with significant autonomy, take responsibility for reviewing the strategic performance of the whole team.

Note: No occupational licensing, certification, or specific legislative requirements apply to these qualifications at the time of writing.

Floristry occupational skills qualifications

Table 4 demonstrates detailed occupational skill qualifications for floral design assistant, floral designer, senior floral designer, and master floral designer. Corresponding core knowledge and skills of up to 10 categories were described for each level floral designer. Recommended educational and career pathways to achieve each level of qualification were also included alongside the corresponding qualification in this framework. These pathways were generalized from the last research study in this dissertation. Generally, the requirements of competencies increase as the level of qualification increases. Higher-level qualifications were built upon the requirements for the lower level qualification.

Table 4 Floral industry Occupational Skill Qualifications framework.

	Roles	Category	Core Knowledge & Skills
Certificate (short-term design class); **High school diploma or equivalent**;  	**Floral Design Assistant**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants
		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity
		Floral Design Skills	Basic application of design elements and principles; Utilize basic floral design techniques; Apply predetermined design ideas; Plan, prepare and construct fundamental floral arrangements; Check the quality of incoming floral products
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for stock
		Customer services	Interact with customers and take care of their needs; Sell floral products
		Design Skills	N/A[z]
		Event Planning & Designing Skills	N/A
		Business Skills	N/A
		Professional Presentation Skills	N/A
		Education & Training	N/A
Higher certificate (AIFD education partners; state floral association certified florist program); **Higher education degrees** (Associate degrees, BA or BS); **CFD**;	**Floral Designer**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants; **Limitations of plant use[y];** **Availability of plant varieties;** **Install and maintain plant displays**
		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity

Table 4 Continued, floral industry Occupational Skill Qualifications framework.

		Floral Design Skills	Check the quality of incoming floral products **Good execution and application of design elements, principles, and various design techniques;** **Plan and create diverse floral designs;** **Create new design ideas above basic level**
		Design skills	**Drawing/Sketch skills to communicate ideas;** **Understanding of good photography skills;** **Understanding of good portfolio design skills;** **Understanding of good website design skills;** **Color uses of designs**
		Customer Services	Interact with customers and take care of their needs; Sell floral products; **Provide quality service to customers;** **Keep social media updated for customers and communicate with customers on social media**
		Business skills	**Provide quotations for floral products;** **Generate and implement marketing strategies;** **Sell and market floral products**
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for stock; **Order and maintain floral supplies and products**
		Event Planning & Designing Skills	**Assisting in planning and designing for special occasions or events;**
		Professional Presentation Skills	N/A
		Education & Training	N/A
Advanced certificate (State floral association master florist program; AIFD education partners);	**Senior Floral Designer**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants; **Limitations of plant use;** **Availability of plant varieties;** **Install and maintain plant displays**

Table 4 Continued, floral industry Occupational Skill Qualifications framework.

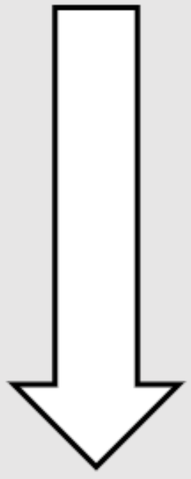
Higher education degrees (Associate degrees, BA or BS, MS, PhD); **CFD**; **AIFD** 		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity;
		Floral Design Skills	Check the quality of incoming floral products; Plan and create diverse floral designs; **Create complex and trendy floral design;** **Skillful application of design elements, principles and techniques;** **Develop innovative design ideas/concepts;** **Innovative ways of using floral products**
		Design skills	**Using software (photoshop, etc.) to communicate design ideas or freehand;** **Professional photography skills for floral design;** **Integrate advanced color theory into design processes;** **Good portfolio design skills;** **Good website design skills**
		Customer Services	Interact with customers and take care of their needs; Sell floral products; Provide quality service to customers; Keep social media updated for customers and communicate with customers on social media; **Manage customer expectations positively;** **Handling customer complaints**
		Business skills	Provide budget quotes for floral products; Generate and implement marketing strategies; Sell and market floral products; **Develop and implement a business plan and mission statement;** **Promote business image;** **Negotiate and make contracts with clients;** **Promote e-business and improve online sales and services;** **Keep accurate, up-to-date financial records;** **Lead and manage employees**
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for products; Order and maintain floral supplies and products; **Created innovative work environment**

Table 4 Continued, floral industry Occupational Skill Qualifications framework.

		Event Planning & Designing Skills	**Plan, coordinate, and design for special occasions or events;** **Create floral designs that fit in an assigned theme or appropriate for occasions;** **Work effectively with other professionals involved in the project**
		Education & Training	**Mentor in the workplace;** **Provide workplace skill instruction;** **Build and maintain good workplace relationships**
		Professional Presentation Skills	**Take care of shop presentation;** **Effective presentation and communication skills for floral showcase**
Higher education degrees (Associate degrees, BA or BS, MS, PhD); **CFD**; **AIFD**; **May have other nationally and/or internationally recognized credentials**	**Master Floral Designer**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants; Limitations of plant use; Availability of plant varieties; Install and maintain plant displays
		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity
		Floral Design Skills	Check the quality of incoming floral products; Plan and create diverse floral designs; Create complex and trendy floral design; Skillful application of design elements, principles and techniques; Develop innovative design ideas/concepts; Innovative ways of using floral products; **Implement global trends of the floral industry;** **Expand global trends for development and implement innovative floral products**
		Design skills	Using software (photoshop, etc.) to communicate design ideas or freehand; Professional photography skills for floral design; Integrate advanced color theory into design processes; Good portfolio design skills; Good website design skills; **Integrate various art forms (apply design concepts of other forms of design such as architecture, fashion design, etc.,) into floral design**

Table 4 Continued, floral industry Occupational Skill Qualifications framework.

		Business skills	Provide budget quotes for floral products; Generate and implement marketing strategies; Sell and market floral products; Develop and implement a business plan and mission statement; Promote business image; Negotiate and make contracts with clients; Promote e-business and improve online sales and services; Keep accurate, up-to-date financial records; Lead and manage employees; **Market and manage business**
		Customer Services	Interact with customers and take care of their needs; Sell floral products; Provide quality service to customers; Keep social media updated for customers and communicate with customers on social media; Manage customer expectations positively; Handling customer complaints
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for products; Order and maintain floral supplies and products; Created innovative work environment
		Event Planning & Designing Skills	Plan, coordinate, and design for special occasions or events; Create innovative floral designs that fit in an assigned theme or appropriate for specific occasions; Collaborate effectively with other professionals involved in the project; **Event management practices**
		Education & Training	Mentor in the workplace; Provide workplace skill instruction; Building and maintain good workplace relationships;
		Professional Presentation Skills	Take care of the shop presentation; **Effective presentation and communication skills for large-scale floral showcases such as conventions, symposiums, and trade shows**

[z] N/A = These skills are not necessarily required for that level.

[y] Bold font = These skills are in addition to the requirements for the previous level.

Discussion and Conclusions

Even though there is a growing interest in establishing national and state-level industry-driven skill standards in the floral industry in the United States, this Occupational Skill Qualifications framework is the first of its kind in the floral industry in the United States. The development of this framework was based on a literature review of similar frameworks/models in the floral industry of other countries with relatively well-developed floral industries, as well as interviewing master designers from other countries to acquire information needed. The framework summarizes knowledge, skills, roles and duties of various levels of floral designers from entry-level to master designer with years of experience in the industry. This comprehensive framework provides details of the core knowledge and skills in 10 categories that a floral designer should have to achieve a certain level.

The framework is tailored to fit the floral industry structure in the United States. The core knowledge and skills for various levels are based on what is most needed, valued, and taught by floral education and training programs in the nation. Additionally, educational and career pathways to achieve each level are briefly summarized alongside the Occupational Skill Qualifications framework. The educational and career pathways framework is also designed particularly for the floral industry in the United States.

There are several potential uses of the framework within the floral industry. Industry practitioners could refer to the framework to position themselves and set career

goals to achieve a higher level on the career ladder based on their current knowledge and skills, education background, industry credentials earned, as well as other factors such as duration of industry experience. At the same time, employees can refer to the framework to know what knowledge and skills they need or desire to acquire and search for educational institutes that provide the corresponding education and training programs. This framework could also assist employers in effective evaluation of employees, communication of expectations concerning what employees should learn to boost workplace productivity and performance, and it could be used by government agencies or policymakers to evaluate education and training programs and to raise workforce skills in the floral industry.

Following the development of the framework, the next step in the research study was to conduct a survey study with industry professionals to evaluate the practicality of the framework and the likelihood of using the framework with the educational and career pathways framework developed in the previous chapter.

CHAPTER IV

EVALUATING THE PRACTICALITY OF THE EDUCATIONAL AND CAREER PATHWAYS AND OCCUPATIONAL SKILL QUALIFICATIONS FRAMEWORKS IN THE FLORAL INDUSTRY

Background

In the previous chapters, the importance of developing the educational and career pathways and occupational skill qualifications in the floral industry has been discussed. A well-structured educational and career pathways system not only addresses the compelling need to upgrade the professionalism of floral designers but also increases the competitiveness of the floral industry in the United States among all the nations worldwide (Alssid et al., 2002). The benefits of implementing occupational skill qualifications include but are not limited to:

- Standardizes norms at the national level, which could be applied across states; provide a trained workforce for the growth and development of the industry;
- Reduces unemployment by supplying world-class skilled employees; build greater transparency, consistency, and credibility in the industry;
- Facilitates transnational recognition and enables all stakeholders to support and identify opportunities for improvement (Arora, 2018).

Collaboration among key academic and industry stakeholders is vital to develop, improve, and promote the adoption of the frameworks. Stakeholders include

representatives from industry, education and training practitioners and experts, professionals, academics, and community groups (Arora, 2018).

Materials and Methods

The objectives of this study were to evaluate the practicality of the educational and career pathways and the occupational skill qualifications frameworks developed in the first two studies by industry professionals. A survey was developed and distributed among Accredited Members of the American Institute of Floral Designers (AIFD) to gain insights from industry professionals and opinion leaders on the opportunities for improvement of the two frameworks.

The experiment was conducted with the use of a survey, distributed both in-person and online. The online survey was developed and administrated with Qualtrics Software (Qualtrics, LLC, 2019). Before initiating the study, the survey was reviewed by the Texas A&M University Institutional Review Board and they determined that the proposed research did not involve human subjects as defined by DHHS and FDA. Therefore, further IRB review and approval was not required (IRB2018-0849).

Participants of the survey included industry professionals with extensive experience in floral design who were members of the American Institute of Floral Designers (AIFD). AIFD and its worldwide accredited members are at the forefront of the floral industry and, as such, act as opinion leaders for the industry. The mission of AIFD is to advance the art of professional floral design through education, service, and

leadership, and to recognize the achievement of excellence in this art form (American Institute of Floral Designers, 2018).

A total of 100 survey booklets were distributed and completed survey responses were collected at the 2019 national symposium of American Institute of Floral Designers (AIFD), in Las Vegas, NV, July 6th - 11th. An online Qualtrics-based version of the survey was also distributed via bulk email sent out by AIFD headquarters to all AIFD members. The online survey responses were collected Oct 10th - 20th, 2019.

The estimated time for completing the survey was 13 minutes. Subjects were asked to sign an informed consent form before taking part in the survey. The survey instrument is comprised of four parts (Appendix A): part 1 of the survey was regarding the educational and career pathway framework developed in study 1; part 2 of the survey was regarding the occupational skill qualification framework developed in study 2; the third part of the survey included nine questions, amongst which, two were open-ended, and seven were close-ended questions. The survey questions include rating the importance of skill sets applicable to four levels of floral designers, rating the likelihood of using the two frameworks, and providing suggestions for improving the frameworks. The last part of the survey collected demographic information from the respondents.

Results

The email blast was successfully delivered to 5558 addresses, which removed bounce-backs and out of office responses. The open rate was 29.5% (1640), and there

were 300 unique click-throughs to the survey link (18.4% CTR). A total of 258 responses were recorded (15.7%).

A total of 143 completed responses were collected, including 123 from online survey and 20 from in-person distribution. Therefore, the response rate for the online survey was 17% and 20% for survey booklets distributed in person.

Demographic characteristics

Demographics were collected, including gender, age, education, working experience, job position, and residency. Demographics of the respondents indicate that they were weighted more towards females (74.8%) (Figure 5). The majority of survey participants were represented in the 51-60-year-old category (38.5%), followed by 61-70 (28.7%), 41-50 (15.4%), and 31-40 (10.5%) age categories (Figure 6). There was a large percentage of respondents who held a Bachelor's degree (38.5%), followed by some college, no degree (22.4%), and graduate-level degree (19.6%) (Figure 7).

About one third (31.5%) of the respondents reported working in the floral industry for 31-40 years (Figure 8). There was an equal distribution across the working experience of 11-20 years (14.7%), 0-5 years (14.7%), 21-30 years (15.4%), and 41 years or over (16.1%) (Figure 8).

As for job position, a quarter (25.2%) of the respondents were retail florists (Figure 9). The second largest group were freelance floral designers (17.5%), followed by floral design educators/researchers (16.1%) (Figure 9). Respondents represented 40

states across the United States (Figure 10), while 3.5% of the participants reported living in Canada (Figure 10).

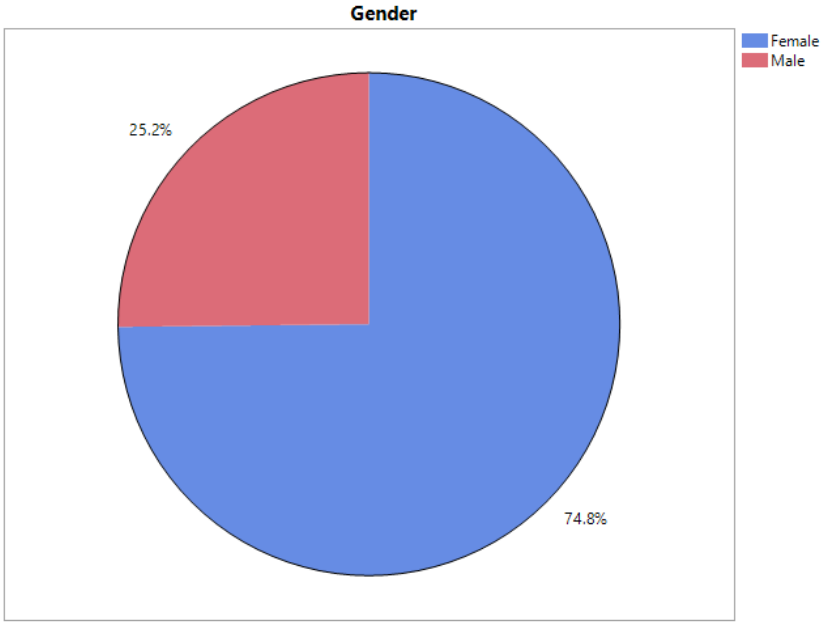


Figure 5 Gender breakdown of respondents for floral industry survey study evaluating two frameworks developed.

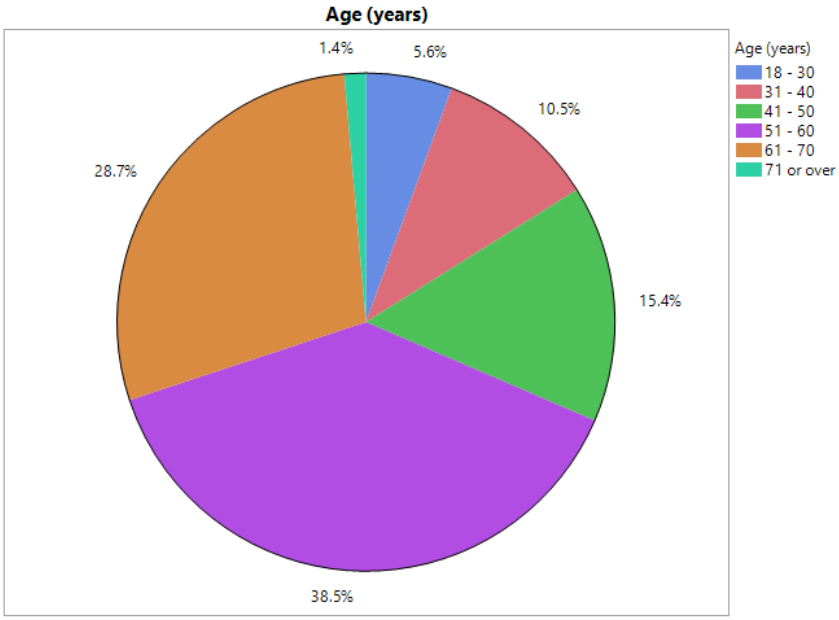


Figure 6 Age breakdown of respondents for floral industry survey study evaluating two frameworks developed.

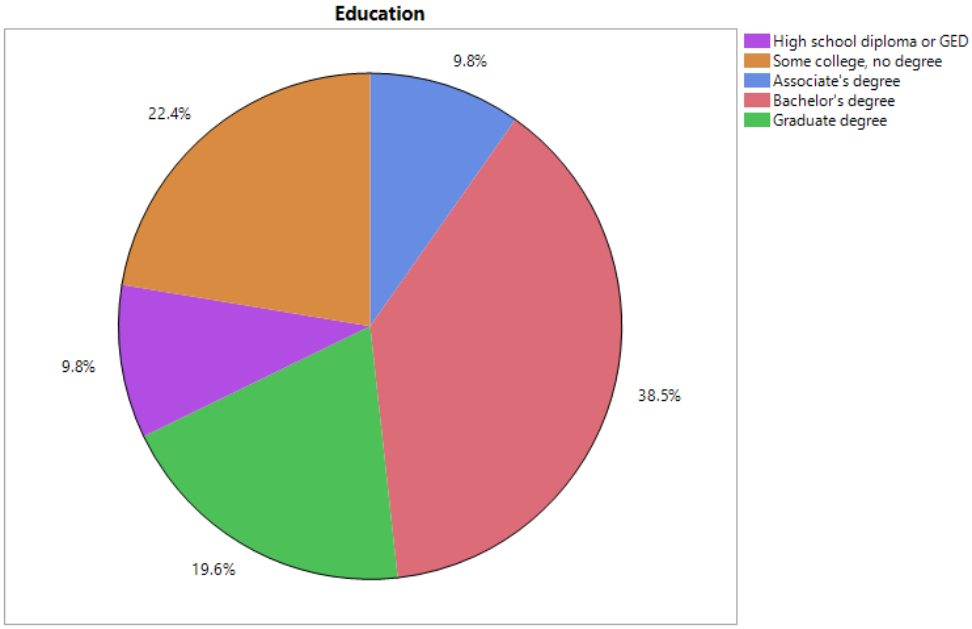


Figure 7 Education level breakdown of respondents for the floral industry survey study evaluating two frameworks developed.

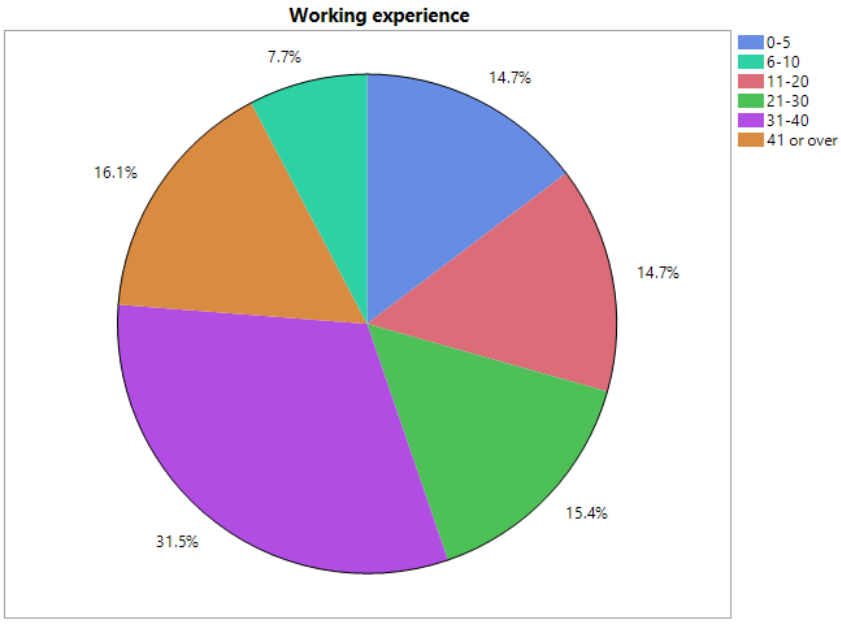


Figure 8 Working experience breakdown of respondents for the floral industry survey study evaluating two frameworks developed.

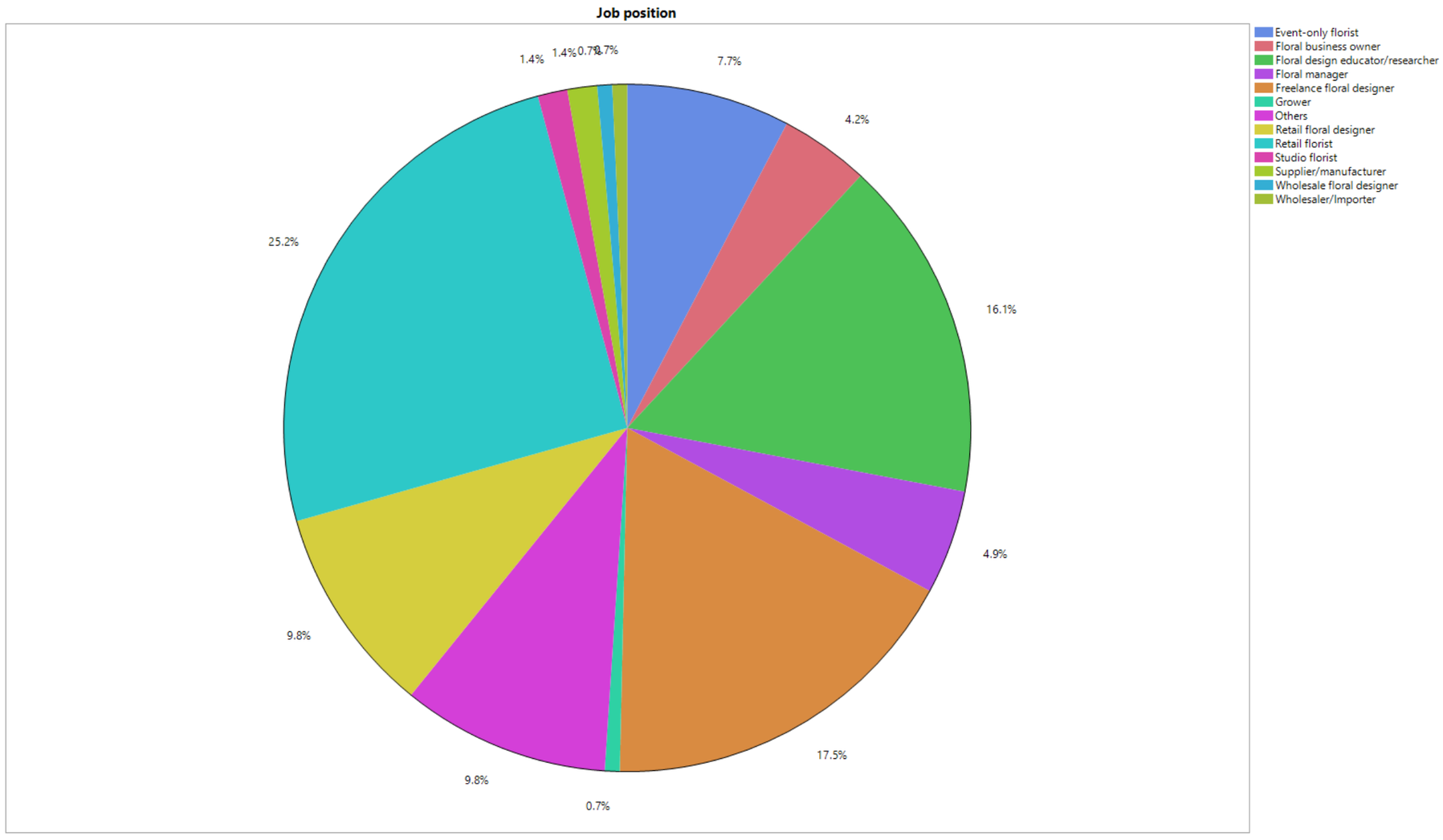


Figure 9 Job position breakdown of respondents for the floral industry survey study evaluating two frameworks developed.

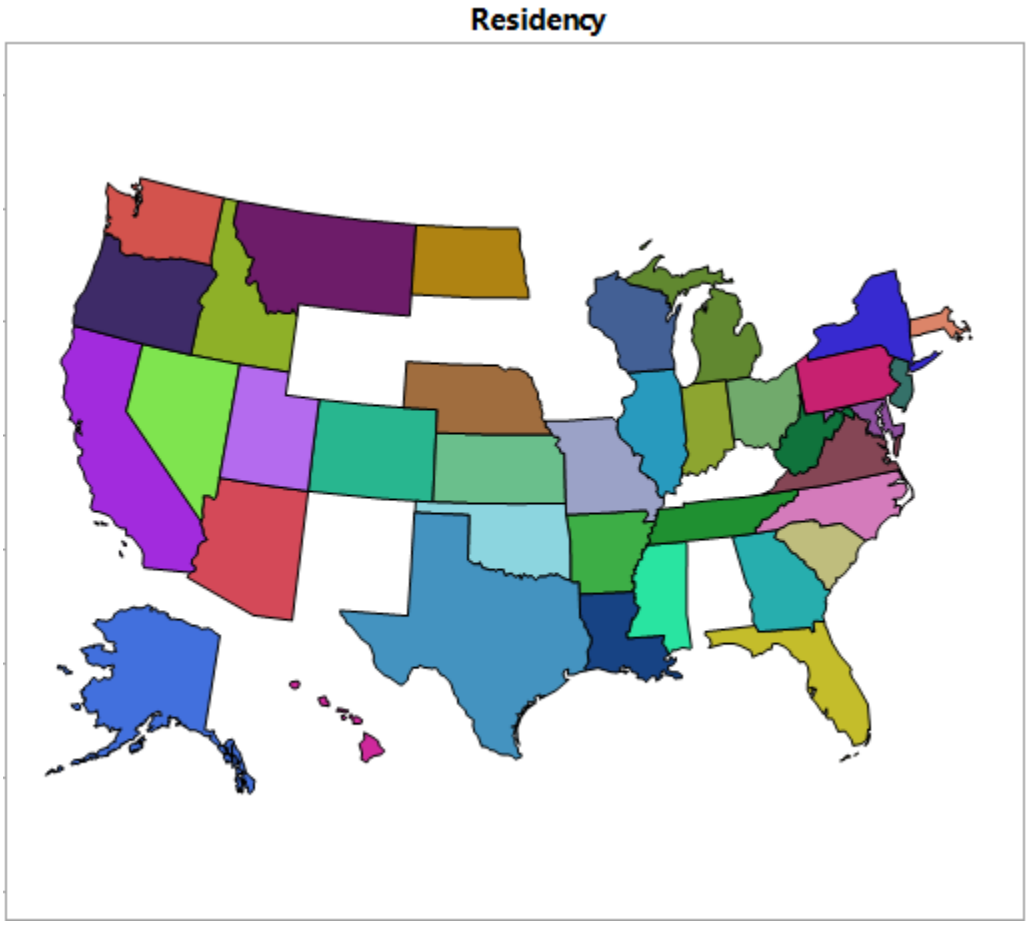


Figure 10 Residency of respondents for the floral industry survey study evaluating two frameworks developed.

Survey respondents' attitudes toward the importance of skill sets

Ten competency categories were identified in the occupational skill qualifications framework developed in study 2 of this dissertation research. To know industry professionals' perceptions on these competency categories, survey participants were asked to rate the importance of skill sets applicable to four levels of floral designers

(i.e., floral design assistant, floral designer, senior floral designer, and master floral designer) on a 7-point Likert scale with 1 being “not at all important” and 7 being “extremely important”.

As shown in Table 5 and Figure 11, the most important skill sets applicable to floral design assistant were customer services (6.1), followed by floristry practices (5.6), support services (5.5), and floral design skills (5.4). Moderately important skill sets included design skills (4.8), horticultural sciences (4.6), education and training (4.6) and business skills (4.2) (Table 5, Figure 11). The least important skillsets for floral design assistant were professional presentation skills (3.8), and event planning and designing skills (3.5) (Table 5, Figure 11).

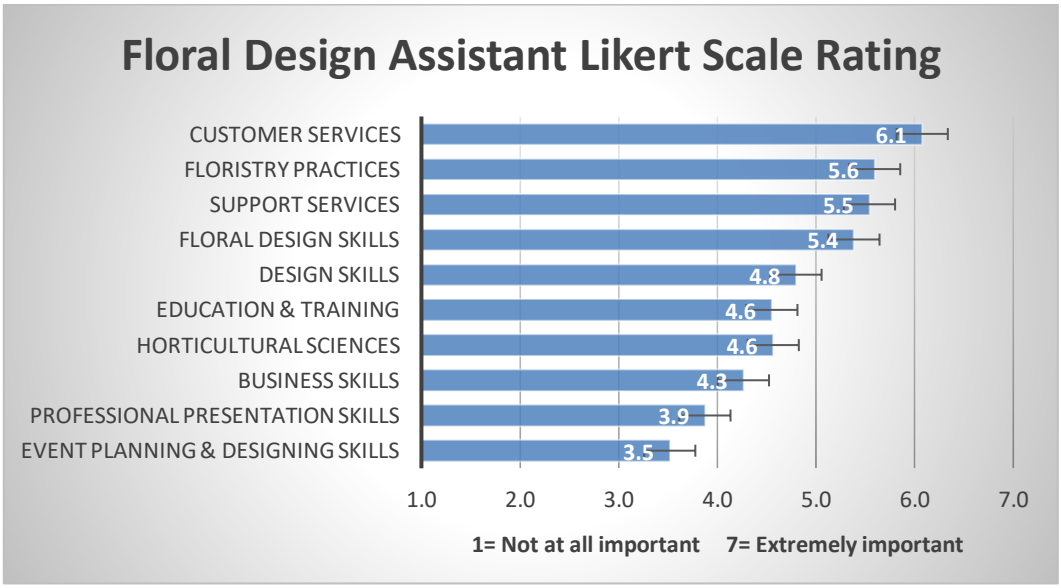


Figure 11 Mean Likert scale importance rating on skill sets applicable to floral design assistant.

Table 5 Likert scale importance rating mean comparison of skill sets applicable to floral design assistant.

Core Knowledge & Skills	Number	Mean	Std Dev	Std Error	F test (p-value) [z]
					38.4332 (<.0001**)
Customer Services	143	6.0839 a	1.1290	0.0944	
Floristry Practices	143	5.6224 ab	1.3830	0.1157	
Support Services	143	5.5455 ab	1.3621	0.1139	
Floral Design Skills	143	5.3846 bc	1.4483	0.1211	
Design Skills	143	4.8042 cd	1.6795	0.1404	
Horticultural Sciences	143	4.5874 d	1.6373	0.1369	
Education & Training	143	4.5524 d	1.8677	0.1562	
Business Skills	143	4.2378 de	1.7073	0.1428	
Professional Presentation Skills	143	3.8252 ef	1.9728	0.1650	
Event Planning & Designing Skills	143	3.4895 f	1.7757	0.1485	

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Levels not connected by the same letter are significantly different.

Regarding floral designer, the most important competency categories were floral design skills (6.5), design skills (6.2), floristry practices (6.2), and customer services (6.2), which were rated equally (Table 6, Figure 12). Support services (5.7), event planning & designing skills (5.6), business skills (5.6), horticultural sciences (5.4), and education & training (5.4) were also rated equally in terms of importance for floral designers following the first group. Professional presentation skills (4.9) were rated the lowest important amongst the ten categories (Table 6, Figure 12).

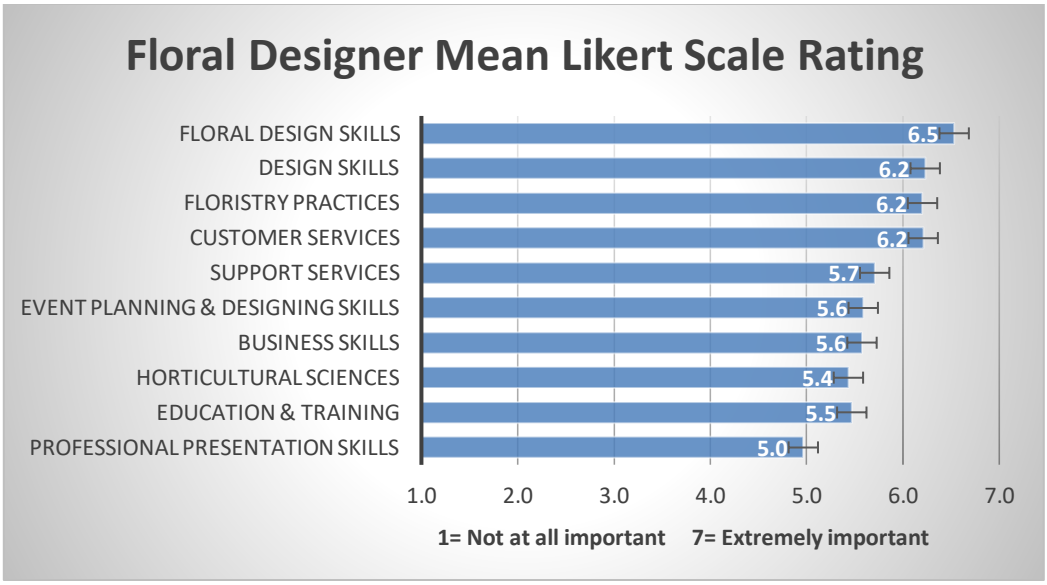


Figure 12 Mean Likert scale importance rating on skill sets applicable to a floral designer.

Table 6 Likert scale importance rating mean comparison of skill sets applicable to a floral designer.

Core Knowledge & Skills	Number	Mean	Std Dev	Std Error	F test (p-value) [z]
					24.2116 (<.0001**)
Floral Design Skills	143	6.5315 a	0.6587	0.0551	
Design Skills	143	6.2448 a	0.9361	0.0783	
Floristry Practices	143	6.2168 a	0.8892	0.0744	
Customer Services	143	6.2098 a	0.9483	0.0793	
Support Services	143	5.7343 b	1.1066	0.0925	
Event Planning & Designing Skills	143	5.6434 b	1.1032	0.0922	
Business Skills	143	5.5734 b	1.2361	0.1034	
Horticultural Sciences	143	5.4336 b	1.3192	0.1103	

Table 6 Continued, Likert scale importance rating mean comparison of skill sets applicable to a floral designer.

Education & Training	143	5.4196 b	1.5941	0.1333	
Professional Presentation Skills	143	4.8881 c	1.8992	0.1588	

The mean Likert scale ratings of nine out of ten skillsets categories were greater than 6 (very important) to be qualified for being a senior floral designer (Table 7, Figure 13). The highest-rated skill sets applicable to senior floral designers were floral design skills (6.7), followed by customer services (6.6) and design skills (6.6) (Table 7, Figure 13). Next in line were event planning & designing skills (6.5) and floristry practices (6.5). Horticultural sciences were rated the lowest amongst all categories, with the mean Likert scale rating being 5.9 (Table 7, Figure 13).

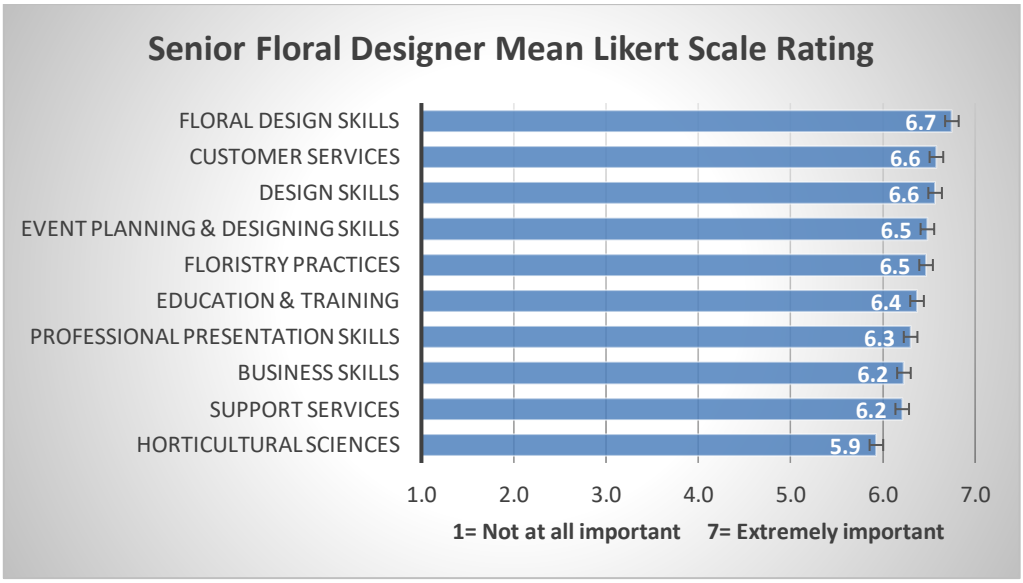


Figure 13 Mean Likert scale importance rating on skill sets applicable to a senior floral designer.

Table 7 Likert scale importance rating mean comparison of skill sets applicable to a senior floral designer.

Core Knowledge & Skills	Number	Mean	Std Dev	Std Error	F test (p-value) [z]
					11.0482 (<.0001**)
Floral Design Skills	143	6.7413 a	0.5401	0.0452	
Customer Services	143	6.5804 ab	0.6860	0.0574	
Design Skills	143	6.5734 ab	0.6660	0.0556	
Event Planning & Designing Skills	143	6.4755 abc	0.7490	0.0626	
Floristry Practices	143	6.4755 abc	0.8034	0.0672	
Education & Training	143	6.3846 bc	0.8469	0.0708	
Professional Presentation Skills	143	6.3147 bc	1.0576	0.0884	
Business Skills	143	6.2238 cd	0.7638	0.0639	
Support Services	143	6.1889 cd	0.8717	0.0723	
Horticultural Sciences	143	5.9301 d	1.2256	0.1025	

All ten categories were rated greater than 6 (very important) for master floral designer (Table 8, Figure 14), indicating great importance of all skill sets to be qualified for being a master floral designer. Design skills and floral design skills were rated the highest amongst all categories with a mean Likert scale rating of 6.9, followed by event planning and designing skills, floristry practices with a mean rating of 6.7 (Table 8, Figure 14). Education and training (6.6), professional presentation skills (6.6), and customer services (6.6) were next in line followed by business skills, support services, and horticultural sciences with a mean rating of 6.5 (Table 8, Figure 14).

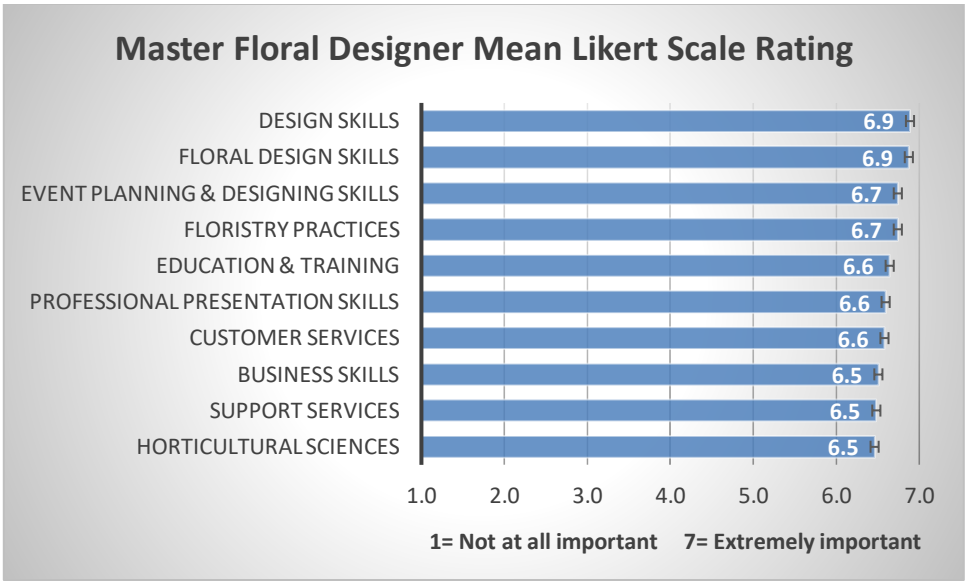


Figure 14 Mean Likert scale importance rating on skill sets applicable to a master floral designer.

Table 8 Likert scale importance rating mean comparison of skill sets applicable to a master floral designer.

Core Knowledge & Skills	Number	Mean	Std Dev	Std Error	F test (p-value) [z]
					5.3069 (<.0001**)
Design Skills	143	6.8811 a	0.4194	0.0351	
Floral Design Skills	143	6.8741 ab	0.5798	0.0485	
Event Planning & Designing Skills	143	6.7413 abc	0.5530	0.0462	
Floristry Practices	143	6.7413 abc	0.7191	0.0601	
Education & Training	143	6.6503 abc	0.7984	0.0668	
Professional Presentation Skills	143	6.5944 abc	1.0294	0.0861	
Customer Services	143	6.5804 bc	0.8592	0.0718	
Business Skills	143	6.5105 c	0.7587	0.0634	

Table 8 Continued, Likert scale importance rating mean comparison of skill sets applicable to a master floral designer.

Support Services	143	6.4755 c	0.9482	0.0793	
Horticultural Sciences	143	6.4615 c	1.0732	0.0897	

Survey respondents' attitudes toward using the two frameworks developed

The second set of close-ended questions were 5-point Likert scale questions to obtain a rating of the likelihood of using the two frameworks that were developed in the first two studies, with 1 point being very unlikely and 5 point being very likely. For the educational and career pathway framework, the survey participants were asked to rate the likelihood of using the framework in assisting individuals in identifying a promising field, guiding yourself for professional development, upskilling employees, and/or maintaining sustained growth of the industry. As for the occupational skill qualification framework, the participants were asked to rate the likelihood of using the framework in promoting the learning process and training investment, communicating expectations for skills, evaluating skills, education and training programs, and raising workforce skills for the industry.

As shown in Figure 15, the mean Likert scale rating of using educational and career pathways framework was 4.2, and that of the occupational skill qualifications framework was 4.3. As for frequency distribution for the likelihood of using the Educational and Career Pathways framework (Figure 16), 41% of respondents selected "Likely" and 39% selected "Very likely". In the meantime, 17% of respondents selected "Undecided", only 3% of respondents selected "Unlikely", and no respondents selected

"Very unlikely" (Figure 16). For the Occupational Skill Qualifications framework, half of the respondents selected "Likely", 38% of respondents selected "Very likely", 10% of respondents selected "Undecided", only 1% selected "Unlikely" and no respondents selected "Very unlikely" (Figure 17). The results indicated that the potential adoption rate of the two frameworks we developed is high.

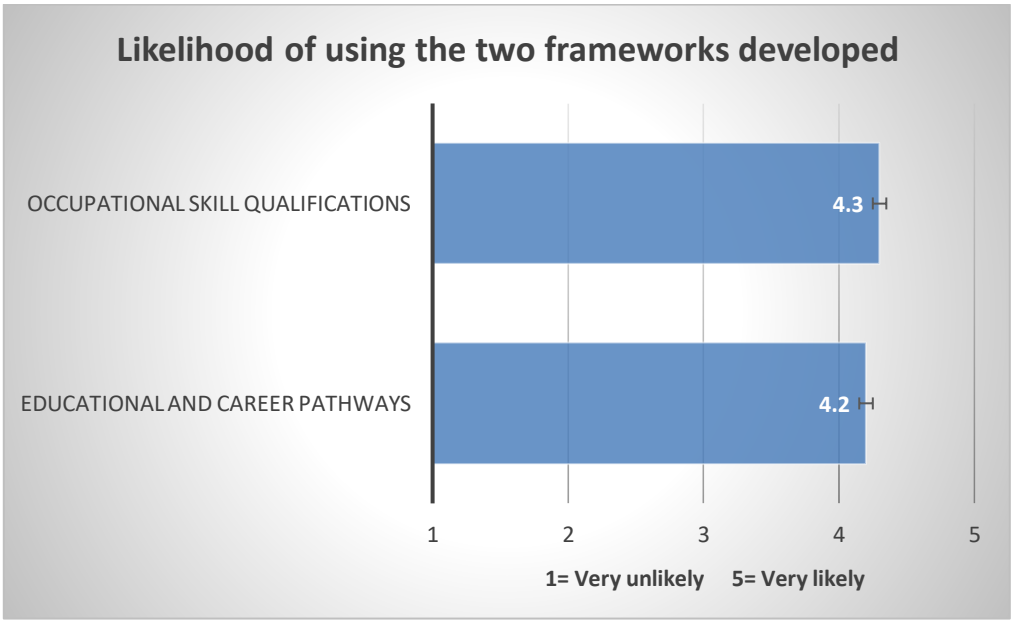


Figure 15 Likert scale likelihood rating of using Educational and Career Pathways and Occupational Skill Qualifications frameworks, respectively.

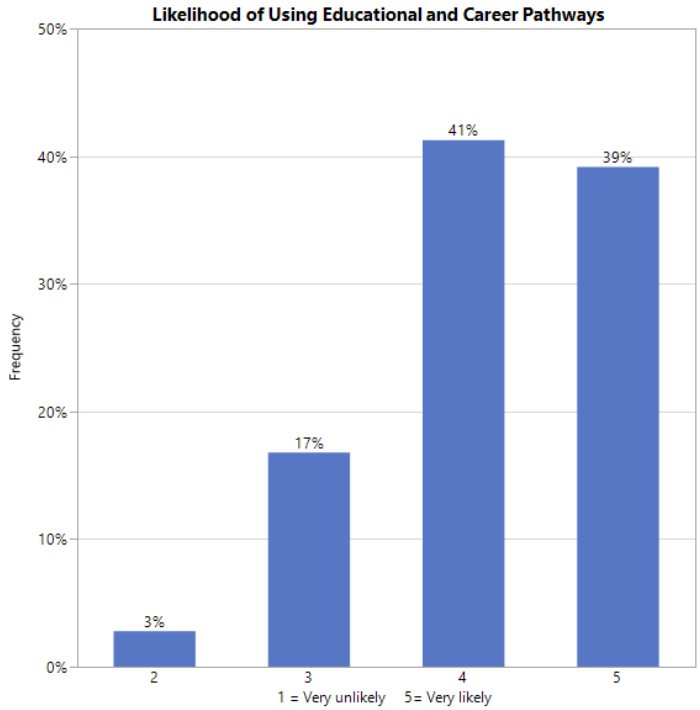


Figure 16 Frequency distribution of likelihood of using the Educational and Career Pathways framework.

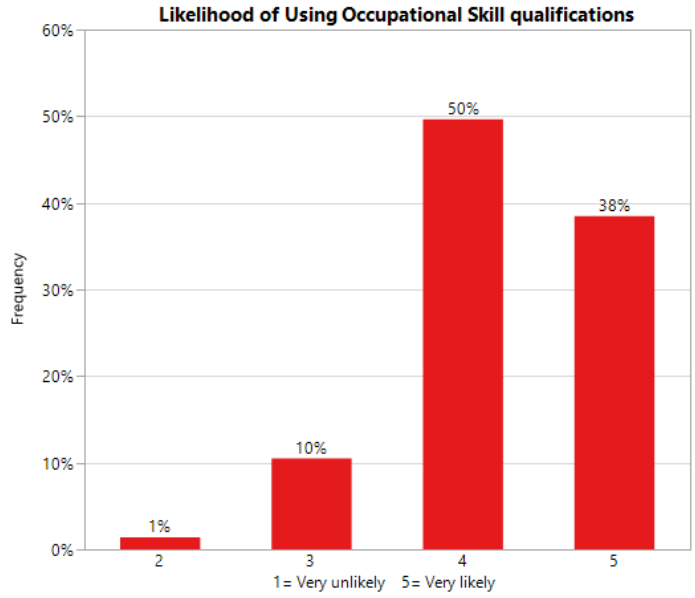


Figure 17 Frequency distribution of the likelihood of using the Occupational Skill Qualifications framework.

Suggestions for improving the frameworks

From the feedback questions in the survey, the frameworks appear to be appreciated and valued by many of the survey respondents. General comments for the frameworks included:

- "Great value in what you've put together."
- "Great job!"
- "Looks great!"
- "Very well done!"
- "Bravo!"
- "No suggestions! Thank you!"
- "I encourage your study!"

Regarding the content, structure, and/or presentation of the frameworks, comments included:

- "This is a well thought through and comprehensive framework."
- "It is very clearly structured."
- "Impressive presentation and excellent framework descriptions."
- "For all facets of the floral industry, it is cohesive and manageable."
- "Though everyone has a different pathway and journey in the industry, this is a nice body of work to understand the steps and what should be requirements in the floral profession."

Comments about the application of the frameworks included:

- "This work is good support for those looking for jobs and the reality of the market."
- "This gives a good and clear path for what is needed in the industry."
- "Very well thought through and supported. A wonderful tool for those of us hoping to mentor up and coming talent."
- "Certainly will help provide direction."

Respondents also mentioned that the framework is very useful, especially the breakdown of skills. One respondent suggested to get the frameworks to High School students and to state agricultural departments as soon as possible.

Suggestions for improving the Educational and Career Pathways framework

Respondents provided various suggestions for improving the two frameworks. Regarding the Educational and Career Pathways framework, feedback could be classified into three categories: suggestions for including more content, suggestions for format or wording in the framework, and suggestions for application and implementation of the framework. Suggestions for adding more content in the framework were:

- "Include the value of internship at a workplace."
- "Include competition as a step toward educational growth and design skills."
- "Include the value of real hands-on experience, which is equal to education."
- "On the job or bench training."

- “The experience gained by actually working in a well-run design facility may take longer to achieve but is equally as valuable.”
- “Please don't discard the farmer/florist model of career paths. Many fall in that field now and in the future. Please figure out a way for them to best ingrate into the floral career pathway.”
- “With online training readily available, some mention should be clearly stated.”
- “Encourage education in other art forms since they connect with floristry.”
- “In my life's experience and worldwide, personal design connections with florists from around the globe (is of great importance). There also needs to be a reach-out on the pathway to those whose talents are beyond reproach and often ascend above even what - in this criterion - is considered a master designer.”
- “If AIFD Membership/Accreditation is the ultimate goal, as shown in all of the possible career pathways - then the question at the beginning of each of these pathways and the question that should be reiterated at each possible advancement juncture is 'WHY'. Why AIFD - what is the connecting point - what is it worth - what is the mission statement, what makes AIFD a/the goal.”

Suggestions for format or wording in the framework included:

- "The suggestion I have is to change the heading colors in the tables or the color of ATM to a darker color."
- "The Doctorate level should not be only Doctor of Philosophy."

Suggestions for application and implementation of the framework was "Educate more individuals at a high school level and assist in placing them in the related field of work. "

Other comments regarding the framework and education and career in the floral industry included:

- "Taking it easy on those people just starting the program but likewise, help them widen their interest, knowledge, and the importance of the floral industry in our community. This is one way of helping out the future designers in their careers as they pursue higher education in this field. It is also very important to offer continuing education to already floral designers to promote, not competition but collaboration amongst designers worldwide."
- "No suggestions, but we should not downplay the fact that if someone has a dream or goal, they can achieve it in the shortest possible way, and still be successful, high school -> CFD-AIFD. Drive = Success."
- "I would like to see all AIFD candidates be required to have either floral school, state floral association, or a 2yr or 4yr degree in a related field. AIFD tests only design skill, and I believe that this is not adequate to be

considered anything more than a designer. Education is the key to our industry, continuing as a viable job choice."

Some respondents also expressed concerns about limited (education) resources in the areas they live in:

- "While this is useful to me as a business owner, I have no knowledge of any educational resources available in our area."
- "Need more educational pathways in the Pennsylvania area."
- "Establish industry-wide certification exams and regional trainings. Can't make it to the symposium."
- "Make the "educational" part more accessible to those in rural areas or far from large cities."
- "I am in Canada where we don't have state associations or similar. As an independent teacher of floral design (in the last two years), I find attracting and providing intermediate or advanced instruction less likely to happen than basic education, which in general seems to be well received. There is little in the way of career pathway information in my experience."
- "Keep the floral programs operational. They're closing all the California ROP and Community College floral programs."

Suggestions for improving the Occupational Skill Qualifications framework

Suggestions for improving the Occupational Skill Qualifications framework included those regarding the content of the framework, suggestions or format or wording, different opinions of current content in the framework, and suggestions for content regarding master floral designer in the framework.

Suggestions regarding the content in the framework included:

- "Adding hands-on competency tests."
- "Proper use of floral maintenance products is very important for every position in the floral industry."
- "Knowledge of plants and gardening is extremely helpful in our business."
- "I don't recall a mention of expected income or availability of health insurance and other benefits for any level. I wish I had thought of those things when deciding at 20 to choose the floral industry. Doing what you love may seem fun and glamorous, but with age comes the reality of the necessity of security."
- "A mention of lifting weight, i.e., 40 pounds, should be incorporated."
- "I think that entry-level florists/horticulturists need to know the OSHA hazards of our industry. Not only maintaining the tools of our industry but know how to use them properly."
- "Continuing education is important for all levels."

- "Continuing education should be requirements for the highest level, Master Florist, to maintain the integrity of the program and assuring that the title. 'Master Florist' does not become easily used. A level of current knowledge must be maintained to hold this prestigious title."
- "Required training from multiple teachers and sources as well as a designated quantity of said courses and or workshops, if the title 'Master Florist' is given."
- "Floristry is unlike almost any other industry. Few other occupations/professions are encompassing from the procurement of raw materials through the delivery of the finished product. The skillset of a master floral designer is huge and requires time and experience to develop/attain. Many occupations require only a small fraction of the requirements/skills of a master/professional floral designer."

There were respondents who expressed different opinions on the content in the framework:

- "Photoshop or web-design is not part of occupational skill qualifications as a requirement. I believe this is probably mostly outsourced."
- "Plant/horticultural qualifications may or may not be important depending on product offering by the shop."
- "Lumping together things like customer service with social media posting is not useful- directly helping customers and being technically proficient

and/or savvy enough to understand marketing and promotion are two wildly different skill sets."

Suggestions for format or wording in the framework included:

- "I am not sure that there is a distinct floral design assistant as a position in a shop. An entry-level position would be expected to have the qualifications of a junior floral designer."
- "With all the qualifications required, perhaps the job titles should be labeled 'Florist' instead of 'Designer'."
- Suggestions for content regarding master floral designer in the framework included:

Other feedback related to the qualifications for floral designers and career in the floral industry included:

- "Education involves a wide range of skills - sometimes it works better if the team has different strengths, so one person is not overloaded, though knowledge of design, business, marketing is helpful for all."
- "To be a floral designer, you should work hard. Top floral designers are all remarkably hardy."

Discussion and Conclusions

From the data analysis of the Likert scale questions in our survey, the range of the mean Likert scale ratings decreased as the level of floral designers went up. For floral design assistant, the range of mean rating was 3.5-6.1 (Figure 11); for floral

designer, the range was 4.9-6.5 (Figure 12); for senior floral design, the range was 5.9-6.7 (Figure 13), and for master floral designer, the range was 6.5-6.9 (Figure 14). Additionally, the mean Likert scale ratings of all skill set categories increased as the level of floral designers went up. These both indicated that the importance of skill sets increased with the level of floral designer.

Customer service was rated greater than 6 across all levels of floral designer (Figure 11-14), thus confirming that no matter what level of the career position one holds, excellent customer service is always key to succeed and excel in the industry. Customer service was rated the most important skill set for floral design assistant, while for other levels of designer, the highest-rated skill sets were floral design skills. This makes sense, intuitively, since a floral design assistant is expected to conduct simple, mostly repetitive design tasks with little creativity involved. Duplicating predetermined designs is also the main component of their duties. Floral design assistants assist designers prepare flowers for arranging, which includes care and handling of flowers. Additionally, they prioritize customer satisfaction, take orders, and may help with inventory. These could explain why respondents rated customer service, floristry practices, and support service skills high, and customer service was rated more important than floral design skills for floral design assistants.

In addition to floral design skills, as the level of designer went up, design skills which involved applying concepts of other forms of art into floral design and floral business played increasingly crucial roles. Floral design is an interdisciplinary field that connects with many different art forms and industries, such as architecture, fashion, art,

etc. Being able to recognize the characteristics of general aesthetics, bring in concepts of other art forms into the world of floral design largely expand the possibilities of floral design, vitalize the floral industry with innovative products and slow down the floral industry's transition to maturity.

The importance of professional presentation skills increased as the level went up. With limited and basic design knowledge and skills, floral design assistants are not required to have superior professional presentation skills compared with higher-level designers who are more actively involved in public presenting occasions such as trade show, floral design convention, education workshop. Event planning and designing skills also followed an upward trend concerning importance ranking. Floral designers with more experience working in the industry may have more opportunities to be involved in planning, designing, and managing small-to-large scale events. This is similar to education and training skills, which is defined as skills for delivering workplace education and training of employees. More expectations of having this skill set were for senior and master level floral designers.

The horticultural sciences competency category is defined as "Knowledge about growth requirements, properties, growth habits and limitations of plant use. Identify botanical materials for appropriate uses in floral design. Know what flowers are in season and when they will be available." In this study, examples of this category include geotropism, phototropism, the toxicity of plants, and appropriate uses of them in the floral arrangement. This category was rated relatively low in importance compared with others. One possible reason may be that respondents interpreted the term as knowledge

of general horticulture, which encompasses a large variety of areas and may not be directly related to floral design.

For the likelihood of using the two frameworks developed, the data analysis showed that 80% of the respondents were likely or very likely to use the Educational and Career Pathways framework (Figure 16), 88% of the respondents expressed likely or very likely to use the Occupational Skill Qualifications framework (Figure 17), and the mean likelihood of uses was greater than 4 (likely) for both frameworks (Figure 15). Additionally, separate emails from survey respondents were received expressing their appreciation towards this work and looking forward to hearing more about the research results. Based on these quantitative and anecdotal likelihood measures, we foresee that the adoption and application of these two frameworks are likely.

CHAPTER V

CONSUMER PREFERENCES AND WILLINGNESS TO PAY FOR FLOWER FORM AND SPECIES

Background

We are in the age of the consumer. In other words, empowered customers are shaping business strategy. Customers expect high-value personalized experiences. It is crucial for floral designers to not only hone their design skills, but also educate consumers about the artistry of floral design, so that their appreciation of floral design would keep up with the rapidly growing industry and increase the likelihood of them being willing to pay higher prices that floral art will need to achieve. Additionally, it is important to learn about why consumers choose to buy floral products and what information, attributes or components of the floral products are more appealing to them than others in the floral market to develop effective strategies to better satisfy consumer expectations, enhance competitiveness, and remain profitable.

Flower form and species are two components that greatly influence the visual impact and aesthetic value of floral design. Currently, there is no study exploring how various forms and species of flowers affect consumers' preferences and willingness to pay for floral arrangements.

Literature Review

Floral consumption overall

According to the USDA National Agricultural Statistics Service, the 2018 wholesale value of sales of floriculture crops was up 6 percent from 2015 (United States Department of Agriculture, 2019). The total crop value was about $4.63 billion at wholesale for growers with sales great than $10,000. Domestic cut flowers account for $374 million in sales for 2018, increased slightly since 2015, according to the Floriculture Crop Summary for 2018 (United States Department of Agriculture, 2019). Internationally, cut flowers account for $21.1 billion of annual sales (van Rijswick, 2015).

Consumer behavior research

Consumer behavior research is commonly used to understand the motivation for consumers' purchase decisions. However, consumer behavior research is challenging because many factors may contribute to influencing consumers' decision-making process and what products they purchase eventually. These influences include internal influences, social influences, and situational influences. In addition, consumers' level of satisfaction could also be impacted by their preexisting expectations, past experiences with similar products, advertising, promotions, and other communications that have passed on the product information to them (Solomon and Stuart, 2003). Consumer behavior research makes it possible for researchers to reveal what information, attributes, and components matters to consumers and what does not. Measurement of

economic consumer behavior will continue with traditional consumer expenditure surveys augmented by high-tech tracking devices (McFadden, 2012).

Consumer research in the floral industry

Consumer research in the floral industry is sparse. Consumer panel data collected from 1992 to 2005 by the American Floral Endowment were used to estimate consumers' choice of floral retail outlets. The panel data cover consumers from 48 states and Washington DC. There were 464,325 monetary transactions reported. In addition to consumers choosing different retail outlets based on what products they purchase, the researchers also found out that consumers prefer to buy arranged flowers over unarranged flowers from traditional freestanding floral outlets and through direct-to-consumer channels (Yue and Behe, 2008). Kim et al. (1999) demonstrated the percentage of floral products were purchased for gifts in Asian countries. Laroche et al. (2001) identified consumers' willingness to purchase environmentally friendly products. Consumers' values, knowledge, and behaviors were studied to analyze the factors that impact what they think about green products. Behe and Barton's study showed that consumers placed plant health and condition as the highest priority when evaluating plant quality (Behe and Barton, 2000). Consumer preferences for horticultural crops such as geraniums (Behe et al., 1999) were studied on with the conjoint analysis. Behe et al. (2005) also conducted consumer research on the floricultural applications of tabletop Christmas trees.

Research on cut flowers and floral design

Cut flowers and floral arrangements have been used for rituals and special occasions throughout history. Today, consumers purchase flowers and arrangements mostly as gifts to express their feelings, such as love, appreciation, sympathy, or for their enjoyment (Yue and Hall, 2010). Factors associated with their purchase decisions include income, age, purchasing occasion, and what flowers are in season. Understanding how these factors influence consumer behavior help researchers to understand consumers' needs so that they could guide the sound development of the industry (Yue and Hall, 2010). In addition, Jowkar et al. (2007) reported that low-quality products and short vase life could inhibit consumers from purchasing flowers. Yue and Behe (2010) found that the color of the cut flower is closely associated with consumer purchasing preferences. Sheth et al. (1991) proposed the theory of consumption values to help understand consumer decision-making behavior. Yue and Hall (2010) reported the changes in purchasing behavior of traditional and specialty cut flowers. Other researches have examined consumer preferences for local and imported products (Gairdner, 2006). Bogash et al. (2012) found that the increasing demand for wide fresh cut flower cultivars is an important factor that keeps the market growing.

The research on the floral arrangement is sparse. Behe et al. (1992) reported that postharvest treatment knowledge added value to a floral arrangement. Huang (2007) stated that when a consumer purchases a floral product, it's crucial for them to know the floral longevity. Jenkins et al. (2013) found that knowledge about floral food increases consumers' perception of a floral arrangement's quality, purchase intention, and they're

willing to pay more for the arrangement. According to a report by First Research (2010), more than half of the retail floral industry revenue comprised of floral arrangement sales. Therefore, it is essential for researchers to understand consumer behaviors and opinions about purchasing these products better. Anderson and Walker (2013) examined the acceptance of applying genetically modified organism (GMO) to cut flowers in the floral design with the implications that most next-generation floral designers demonstrate willingness to sell both GMO and non-GMO flowers.

Color and symmetry

No matter how talented, to analyze the theory and psychology of color is still one of the most essential skills a florist should master. The first impression of floral design is mostly through the color presented, which is, for most consumers, the deciding factor for purchase decision.

Color preference can be predetermined by human psychological evolution through choosing flowers providing signs to a rich and safe habitat. Flowers, as signs, are visible from a distance and therefore are vibrant and full of depth. Blue and green colors are associated with lush vegetation, water resources, clear sky, or a rich and safe habitat. Brown and yellow are generally considered as barren land, drought-ridden, or no vegetation. Red is regarded as a stimulating color but not necessary to be associated with beauty.

As for floral shop consumers, red and pink are the most preferred flower color choice contrasting with blue and yellow at the least preferred flower choice (Behe et al.,

1999; Yue and Behe, 2010). Hula and Flegr (2016) found that when testing which cut flower color was most appealing, blue was the top-rated color followed by purple and pink. 2006 residents of the Czech Republic had no preference for white flowers, and yellow flowers were negatively appealing. They did not test red/orange flowers. It is hypothesized that general human color preference for each region, American or Europe, also applies to flowers (Hula and Flegr, 2016). The highest-rated flower color, blue, significantly affected the beauty rating of flowers no matter the shape.

For container gardens, when ranking factors price was the most important factor, followed by care card when purchasing to color harmony being last (Mason, 2008). Complementary color combinations were most preferred, followed by monochromatic color, and finally analogous as least preferred (Mason, 2008). An interesting note from this study was that women put greater relative importance on price, while men put greater relative importance on color harmony. Men also valued the complementary color harmony more than women. Mason (2008) also noted in their discussion that participants potentially couldn't distinguish the color harmonies, and so making harmonies very apparent, and almost obnoxious, could help participants. Flower color was an important attribute in consumer purchase decision-making in a geranium study (Behe et al., 1999) and in an edible flower study (Kelley et al., 2004) in which color harmony preferences were studied.

Most consumer preference studies reviewed investigated single-color preferences, except the edible flower study (Kelley et al., 2004), in which color harmony preferences were studied. Studies examining overall color ranking have usually

described as blue and red as the top colors (blue was often preferred slightly more by men and red by women) and yellow near the bottom (Camgöz et al., 2002; Ellis and Ficek, 2001; Hurlbert and Ling, 2007; Schloss et al., 2013; Zemach et al., 2007). Color preferences also seem to be culturally dependent. For example, East Asian cultures have a preference for white color (Saito, 1996), while members of the African Himba tribe highly esteem yellow and do not like blue (Taylor et al., 2013).

Quite a bit of literature agrees that items that are most recognizable are most appreciated and easily processed by the human brain. The most easily processed are symmetrical objects, which generally are the most aesthetically pleasing (Enquist and Arak, 1994; Enquist and Johnstone, 1997; Jacobsen and Hofel, 2002; Jacobsen et al., 2006; Leder et al., 2004). Studies have shown that moderately complex objects are most preferred over very low or very high complexity because very low complexity is considered "boring" to assess while very high complexity is considered "confusing and hard to process" (Akalin et al., 2009; Hekkert and Wieringen, 1990; Reber et al., 2004).

The length of time required to process fluency shortens, and the object preference increases with the increase in an object's axes of symmetry (Evans et al., 2000; Tinio and Leder, 2009). Though some researchers claim humans have an inherent preference for bilaterally symmetric flowers due to the human selection of partners, Evans et al. (2000) found that radially symmetrical flowers are more preferred than bilaterally symmetrical flowers (Little and Jones, 2003). Hula and Flegr (2016) found in their study that participants found bilateral symmetry and sharp contour most appealing in flower selection.

Many studies suggest humans also prefer round objects over sharp, pointed objects (Bar and Neta, 2006; Leder et al., 2011; Silvia and Barona, 2009; Westerman et al., 2012). Some studies say this is a temporary fashion and hypothesize that though sharp objects evoke strong feelings, they are necessarily negative (Carbon, 2010). They could be related to mystery, power, and be aesthetically pleasing (Coss, 2013).

Materials and Methods

Flower form: experimental design

The objective of this study was to evaluate how flower forms in the design affect consumer's willingness-to-pay when browsing for a relatively inexpensive design (e.g., Is filled space most important?) versus when they look for an expensive design (e.g., Is differentiation more important?). In other words, we hypothesized that consumer's willingness-to-pay (WTP) for designs with different forms of flowers may signal consumer's preferences of design which, relates to the perceived value of flower forms in the design.

Five types of floral designs were created: hand-tied bouquet, horizontal, asymmetrical triangle, loose vase, and parallel.

Figure 18 Five types of floral designs created for flower form study.

Hand-tied bouquet and loose vase are the most common design styles in the floral market. Horizontal and triangle designs are geometric designs, which are typical American floral designs. We chose to do horizontal and asymmetrical triangle design so that we could cover both symmetrical design (horizontal) and asymmetrical design (asymmetrical triangle). Triangle shape is a popular choice for floral design. Parallel design is a classic design style that was developed by European floral designers and has become a popular alternative to mass style designs.

There are four types of flower form, line, mass, filler, and form (Note: we call form flowers unique/ novelty flowers in this study to differentiate from the term "flower form"). Mass flower is single stems with one solid flower. Line flowers are generally linear, gives a feeling of length and create rhythm in the design. Filler flowers are

branchy, add emphasis to main blossoms, and unique flowers, with distinctive shapes, are commonly used in the focal area.

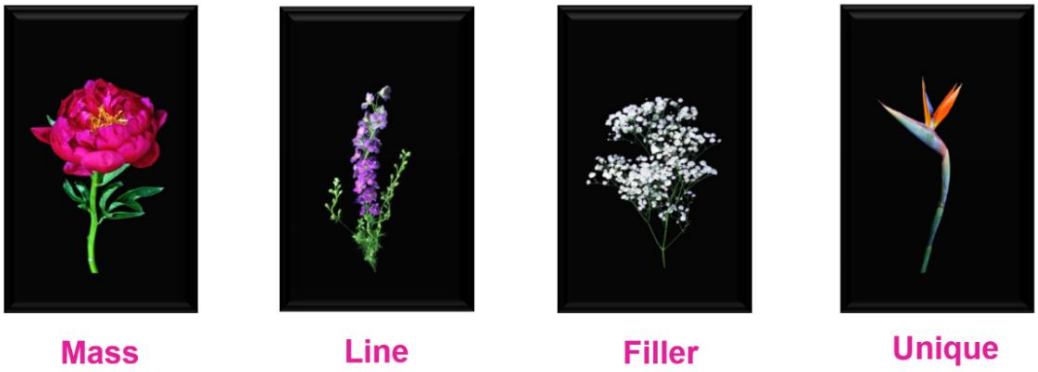


Figure 19 Four form types of cut flower.

Since flower forms interact with each other to create a complete holistic design, we couldn't study the mass, line, filler, or unique/novelty attributes by themselves. Therefore, we created four floral arrangements within each type of the five designs following the order (Table 9):

1. Mass flowers only
2. Mass and line flowers
3. Mass, line, and filler flowers
4. Lastly, mass, line, filler and unique/novel flowers

Previous studies have found that color affects consumer preference and, thus, their purchasing behavior (Yue and Behe, 2010). Previous research on container gardens revealed that complementary color harmony was most preferred (Mason, 2008). The result of our choice experiment also confirmed consumers prefer complementary color harmony. To avoid the influence of color differences on consumer preferences, we used

complementary color harmony with yellow and purple (or adjacent colors) for all of the floral designs in this experiment.

Table 9 Floral design attributes and levels.

Attribute	Levels
Floral design type	Hand-tied bouquet, loose vase, horizontal, asymmetrical triangle, parallel
Flower form type	Mass only Mass and line Mass, line and filler Mass, line, filler and unique/novelty
Price	$20, $80

Flower form: online survey

The experiment was conducted with the use of an online survey, developed and administrated with Qualtrics Software (Qualtrics LLC, 2019) (Appendix B). Before initiating the study, the survey was approved by the Texas A&M University Institutional Review Board approval (IRB2018-1627M). The online Qualtrics survey was distributed, and subjects were recruited via Amazon Mechanical Turk (MTurk), which is a crowdsourcing marketplace for businesses to perform tasks such as online surveys. Participants were recruited with $1 compensation per worker to participate in our survey study to acquire good quality data. Several "attention check" and "bot detection" questions were included to prevent errant or fraudulent responses.

The estimated time for completing the survey was 20 minutes. Subjects were asked to sign an informed consent form before taking part in the survey. The informed consent form contained required information about the objective of the study, the risks and benefits of participation, and acknowledged that failing attention checks in the

survey would result in being rejected for continuing the survey and would not be paid. Subjects who agreed to participate in the study were shown the survey questions upon giving consent. Subjects who failed any of the three attention checker questions in the survey were taken to the end of the survey without payment.

The online survey included 40 open-ended questions, asking subjects, “How much would you be willing to pay for this arrangement?” A floral design picture was shown to the subjects under each willingness to pay question. The subjects were asked to only put dollar value without dollar sign in the text box. The content validation was set to be numbers only with the minimum being 0, maximum being 250, and 2 decimals maximum. Each one of the five types of floral design at each price point was set to be one block. The order of the ten blocks shown to the subjects was randomized. Within each design type, four floral arrangement pictures were shown to the subjects following the order: mass flowers only; mass and line flowers; mass, line, and filler flowers mass, line, filler, and unique flowers. This order was fixed. An example of a willingness to pay question is shown in Figure 20.

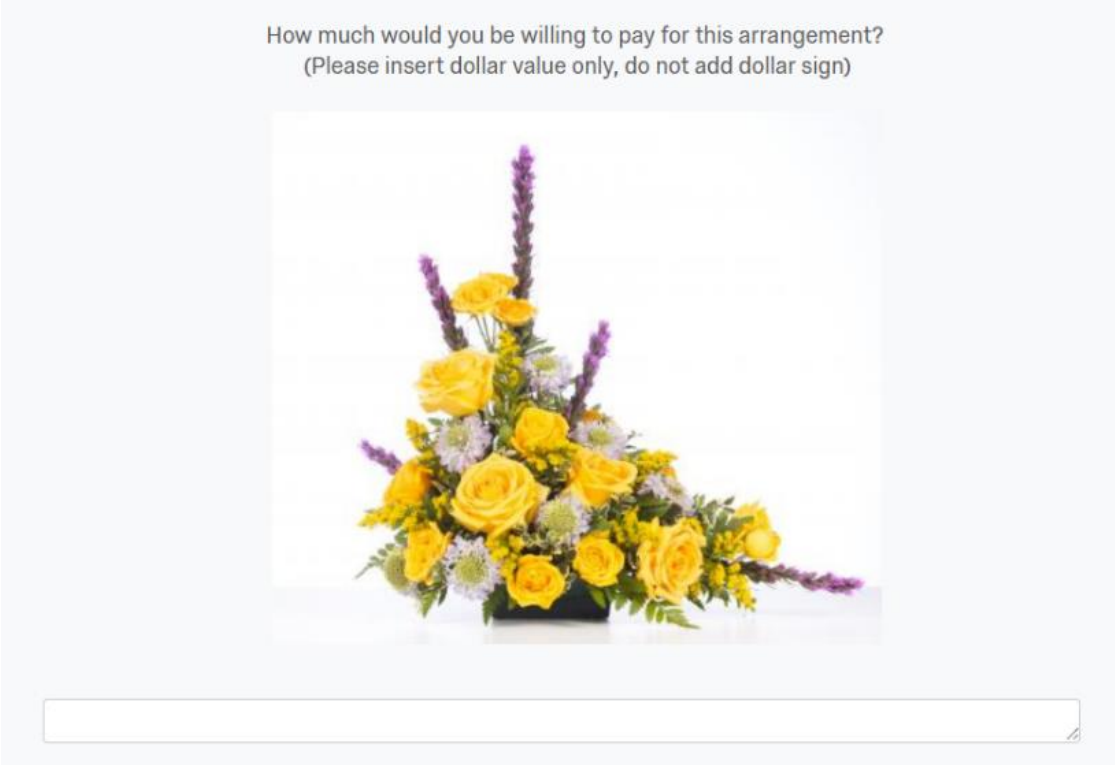


Figure 20 Example of willingness to pay question for flower form type experiment.

Subjects were asked to provide demographic and behavioral information at the end of the survey, including gender, age, education, annual income, race, and frequency of flower purchase.

Flower form: sample size estimation

Before conducting the online survey, G*Power (version 3.1) was used to estimate the sample size needed to achieve statistical validation. The statistical test used was t-test for difference between two independent groups. With medium effect size ($d = 0.5$), confidence level at 95% ($\alpha = 0.05$) and power ($1-\beta$) = 0.80, sample size needed was 128.

Flower form: statistical analysis

The statistical analysis used JMP software (version 14, SAS Institute, Cary, NC). A multiple Linear Regression model was used to measure differences in willingness to pay for each type of floral design with different form types of flowers. We chose a hand-tied bouquet with mass flower only as the baseline for comparison of WTP as hand-tied bouquet is the most common design style in the floral market.

The regression model for subjects' WTP can be represented by the following equation:

$$Y = \beta_0 + \beta_1 D_{Horizontal} + \beta_2 D_{Triangle} + \beta_3 D_{Loose\ vase} + \beta_4 D_{Parallel} + \beta_5 D_{Line} + \beta_6 D_{Filler} + \beta_7 D_{Unique} + \varepsilon$$

Where Y represents the dependent variable WTP, β_0 is the intercept, which represents the subjects' WTP of hand-tied bouquet with mass flower only. D represents dummy variables or binary variables that take on the value of 1 or 0. $D_{Horizontal}$=1 if horizontal design, 0 otherwise; $D_{Triangle}$=1 if triangle design, 0 otherwise; $D_{Loose\ vase}$=1 if loose vase design, 0 otherwise; $D_{Parallel}$=1 if parallel design, 0 otherwise; D_{Line}=1 if with line flower, 0 otherwise; D_{Filler}=1 if with filler flower, 0 otherwise; D_{Unique}=1 if with unique flower, 0 otherwise. β_1 - β_7 represent vectors of coefficients to be estimated for floral design styles and flower form types. The estimated β_1 - β_7 coefficients in equation measure differences in WTP for each of the design types and flower form types in comparison to WTP of hand-tied bouquet with mass flower only. ε is the error term.

Other statistical tests used in this experiment included Student's t-test, Analysis of Variance (ANOVA), and Wilcoxon Rank Sums test for comparing means, Tukey's range test for mean separation, and Komologorov-Smirnov-Lilliefors test for normality of willingness to pay distributions.

Species substitution: experimental design

The objective of this study was to understand consumer preferences for species of flowers. The experiment was designed to evaluate whether consumers' willingness to pay for an arrangement changes if we substituted high-cost flowers with the same color, similar shape, but less expensive species. Five stems of expensive species were substituted with less expensive ones in each design set. We wanted to know whether consumers would notice the substitution and if it ultimately made a difference in their perceived value and beauty rating of the arrangements.

The design style chosen for this experiment was hand-tied bouquet, as it is the most common style in the market. We used the top four imported flowers -- rose, carnation, chrysanthemum, and alstroemeria as the inexpensive species to see if they could substitute expensive species.

The expensive species chosen that resembles alstroemeria was nerine. The wholesale price for alstroemeria was $0.67 per stem and $2.50 for one stem of nerine. Ranunculus was the expensive species for carnation, as they are both round, have many layers of petals. The wholesale price for ranunculus was 1.83 per stem, and that for carnation was 0.49 per stem. For rose, we wanted to see if it could be used for

substituting double lisianthus, which costs more than twice as much as a regular rose ($2.40 versus $1.15 per stem). Dahlia was the expensive species for football chrysanthemum. The wholesale price of dahlia was $4.64 per stem as opposed to $1.10 per stem for football chrysanthemum.

Species substitution: online survey

This experiment was built in the same Qualtrics online survey (Appendix B) with flower form study, which was approved by the Texas A&M University Institutional Review Board approval (IRB2018-1627M).

The online survey included eight questions for this experiment, four open-ended willingness to pay questions (Figure 21), and four 5-point Likert scale questions (Figure 22). For willingness to pay questions, subjects were asked: “How much would you be willing to pay for this arrangement?”. A floral design picture was shown to the subjects under each question. The subjects were asked to only put dollar value without dollar sign in the text box. The content validation was set to be numbers only with the minimum being 0, maximum being 250, and 2 decimals maximum. For Likert scale questions, we asked the subjects to express their agreement of a question, “Is this floral arrangement aesthetically appealing to you?” on a 5-point Likert scale. The five points were, 1= strongly disagree, 2= somewhat disagree, 3= neither agree nor disagree, 4= somewhat agree, and 5= strongly agree.

“Between subjects” design was conducted for this experiment. The survey subjects were divided into two groups for this experiment. One group could only see and

rate the bouquets with expensive species, and the other could only see and rate those with inexpensive species.

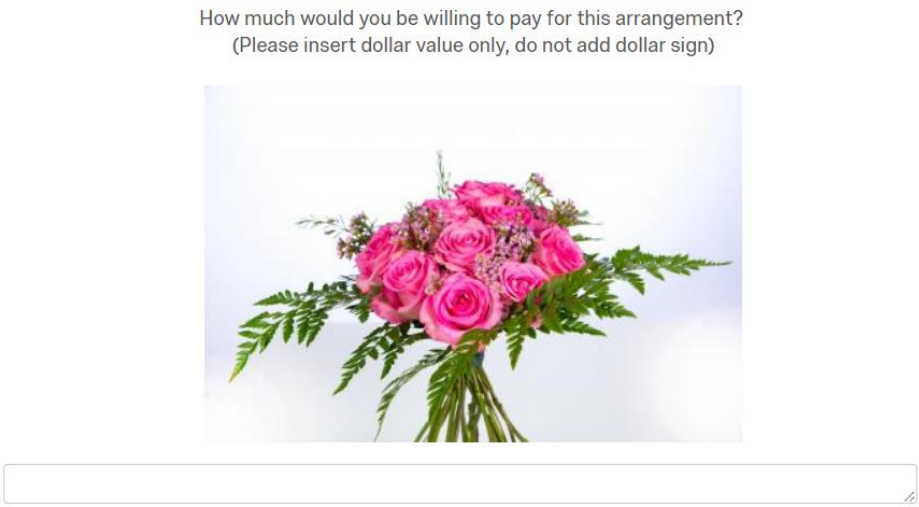


Figure 21 Example of a willingness to pay question for species substitution study.

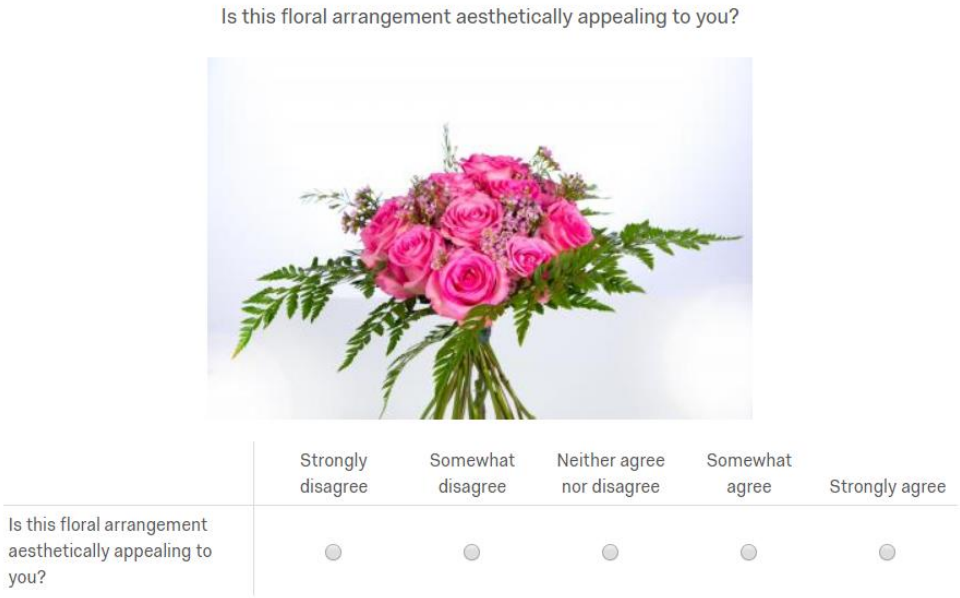


Figure 22 Example of a 5-point Likert scale question for the species substitution study.

Species substitution: statistical analysis

Student t-tests were used to measure differences in willingness to pay for the design sets. Student t-test and Wilcoxon Rank Sums test were applied for comparing Likert scale ratings between bouquet with expensive species and inexpensive species.

Flower symmetry: experimental design

Flower symmetry refers to whether and how a flower can be segmented into identical or mirror-image parts of itself. The most commonly seen flower symmetry types in nature are bilateral, radial, and asymmetric. Bilateral flowers can be divided by only a single axis into two mirror-image halves, much like a person's face. Examples are orchids. Most flowers in nature are radial, which can be divided into three or more identical sectors, which are related to each other by rotation around the center of the flower. Examples of flower species in this category are rose, carnation, lily, and chrysanthemum. Uncommonly, some flowers may have no axis of symmetry at all, type of flowers are called asymmetric flowers. Calla lily and bird of paradise are two examples of this group.

In this study, we rated the perceived beauty of flowers with bilateral, radial symmetry, and asymmetric flowers. The objective of this study was to determine which flower symmetry is more preferred than others. We expected symmetry would play an important role in the evaluation of flower beauty. The research question for this experiment was: Are bilateral symmetry flowers more attractive than radial symmetry flowers?

A total of eight flowers were investigated in this experiment, two with bilateral symmetry, which were Anthurium and Phalaenopsis orchid. Four flowers were in the radial symmetry group, which were dahlia, rose, ranunculus, and daisy pompon chrysanthemum. The third group, asymmetric flowers, included calla lily and bird of paradise.

Flower symmetry: online survey

This experiment was conducted using the same Qualtrics online survey tool (Appendix B) used with the flower form type and species substitution studies, which was approved by the Texas A&M University Institutional Review Board (IRB2018-1627M). The online survey included eight questions for this experiment. Each question had a picture of a flower under the question, “Is this flower aesthetically appealing to you?” The subjects were asked to express their agreement with a question on a 5-point Likert scale. The five points were, strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree (Figure 23). The color of the pictures was removed, and the size of the flowers in the picture was synchronized to avoid the effect of color or size on the beauty rating. An example of a Likert scale beauty rating question is shown in Figure 7. The order of the pictures seen by the survey subjects was randomized to avoid the ordering effect.

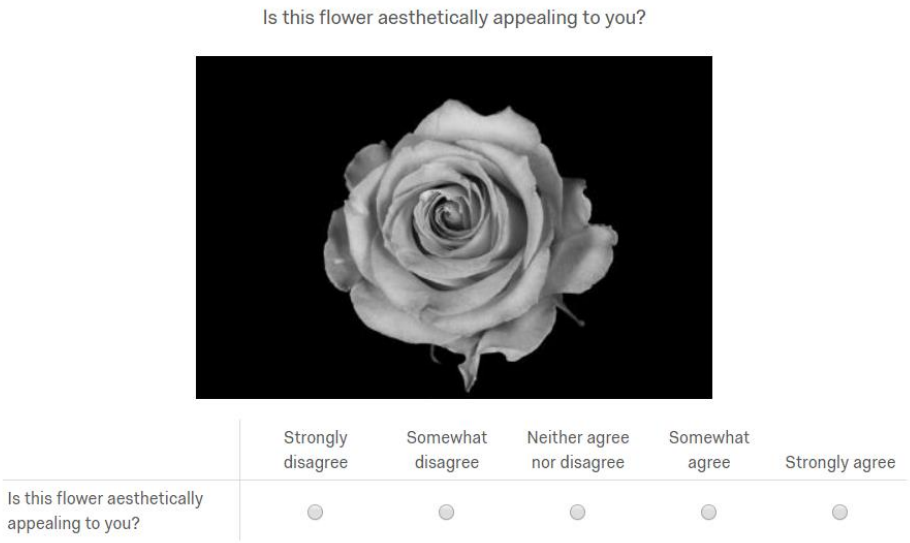


Figure 23 Example of a 5-point Likert scale beauty rating question for individual flower symmetry survey study.

Flower symmetry: statistical analysis

The Wilcoxon rank-sum test was applied for comparing Likert scale ratings, and Tukey's range test was used for mean separation and comparison.

Results

Demographic characteristics

A total of 131 consumers (whose ages were between 18 and 74 years old) participated in the online survey. Demographics were collected, including gender (Figure 24), age (Figure 25), education (Figure 26), annual income (Figure 27), race (Figure 28), and frequency of flower purchase (Figure 29). Demographics in this study were weighted more towards millennials and Gen X, persons in the "white" race

category, as well as people with an Associate's degree or Bachelor's degree, which is in line with the relative levels of the annual income.

Fifty-three percent of the subjects were female and 47% male. The largest age group was 18-34 years old, which accounts for 38.2% of the subjects, followed by subjects who are 35-44 years old (31.3%). 45% of the subjects have an Associate's degree, followed by those who have some college or Bachelor's degree. Survey subjects who make $30,000 - $49,999 represent 30.5% of the sample frame, followed by those who make $50,000 - $69,999 per year. The vast majority of the subjects were White, followed by Asian, which makes up 8.4% of the sample. As for the frequency of flower purchase, people who purchase flowers a few times weekly or monthly was the largest group, accounting for 67.9% of the sample. Subjects who purchase flowers a few times yearly made up 22.9% of the sample frame.

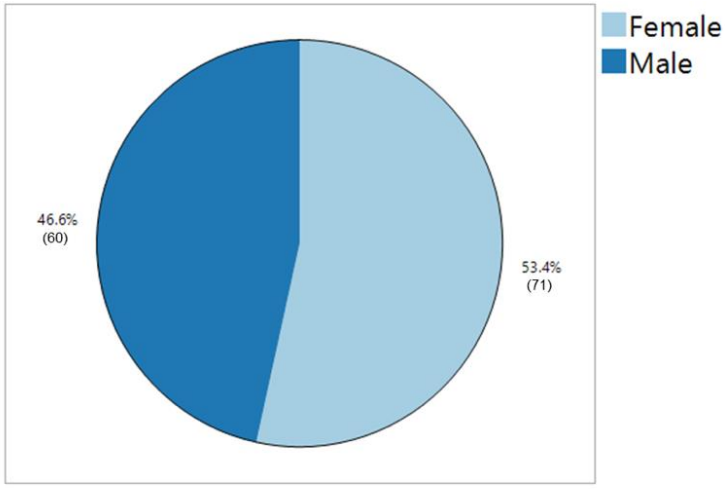


Figure 24 Gender breakdown of respondents for flower form and species survey study.

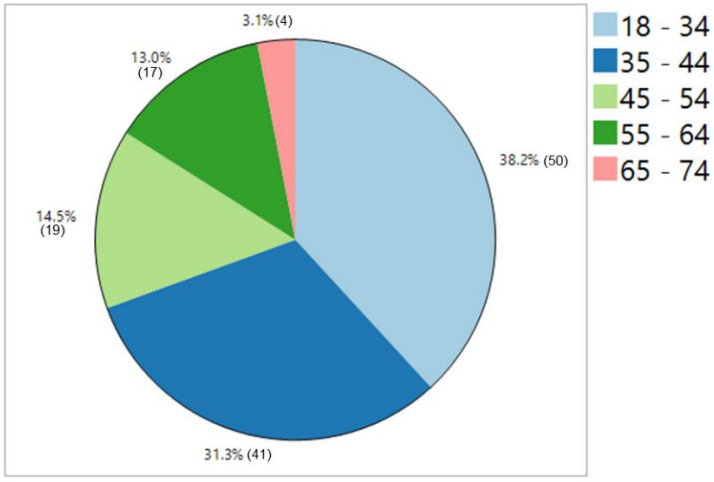


Figure 25 Age breakdown of respondents for flower form and species survey study.

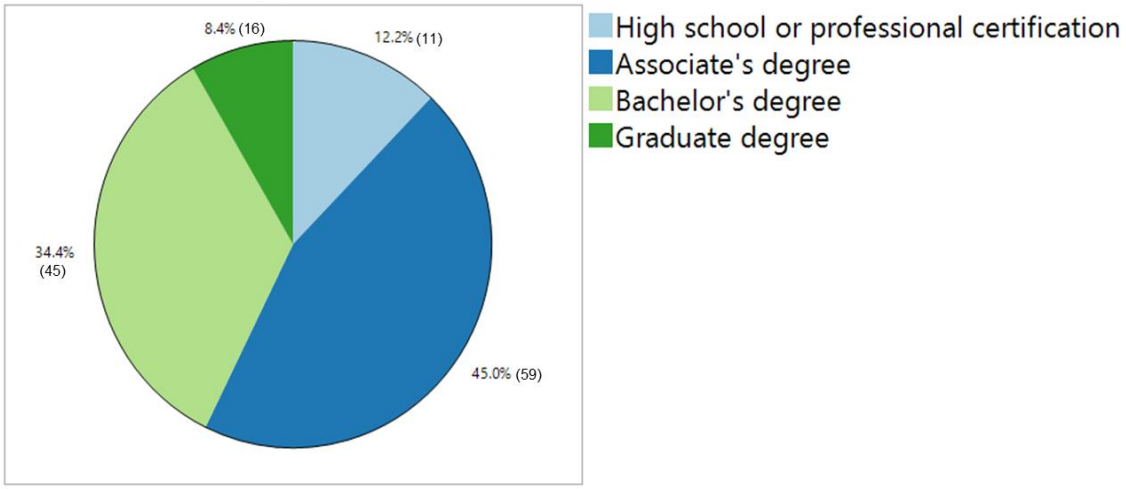


Figure 26 Education breakdown of respondents for flower form and species survey study.

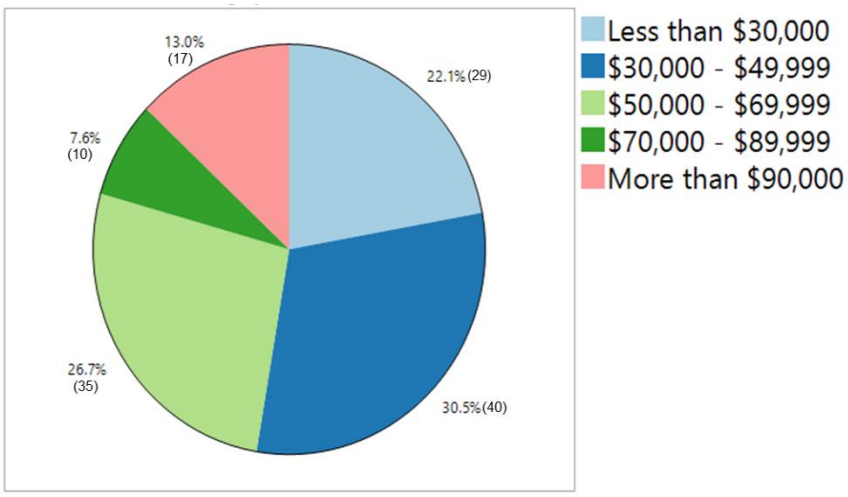


Figure 27 Annual income breakdown of respondents for flower form and species survey study.

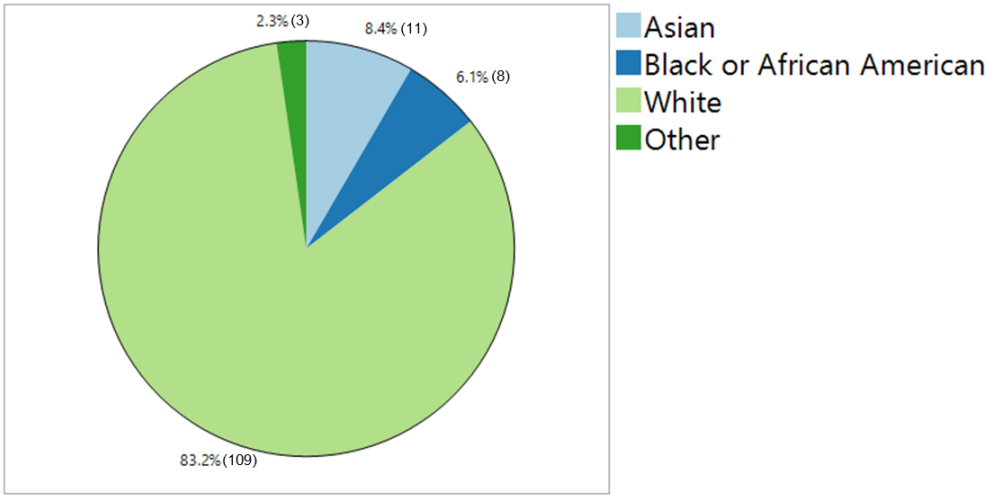


Figure 28 Race breakdown of respondents for flower form and species survey study.

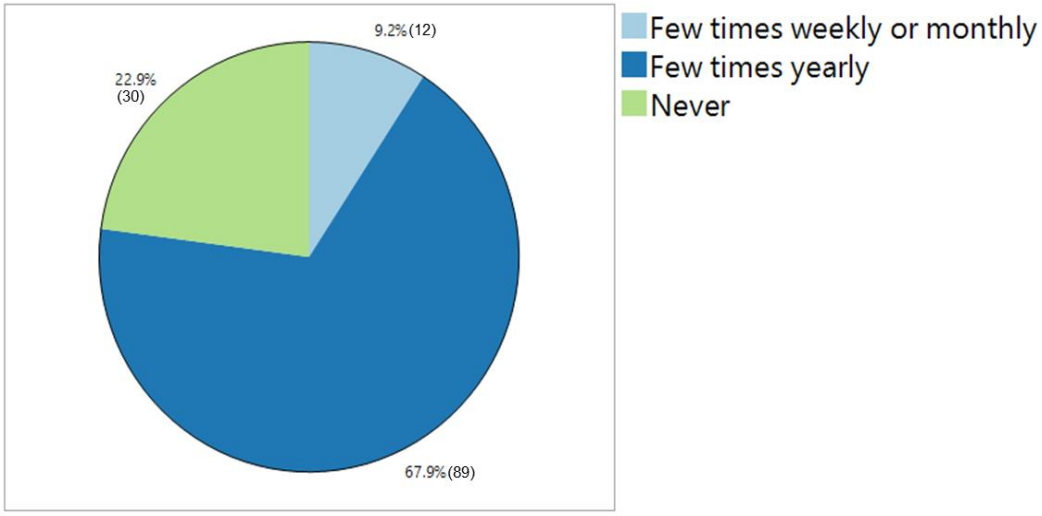


Figure 29 Frequency of flower purchase breakdown of respondents for flower form and species survey study.

Willingness to pay of flower form: multiple linear regressions

The willingness to pay results for floral designs at the $20 price point and the $80 price point are shown in Table 8 and Table 9, respectively. At the $20 price point, the intercept, which was the willingness to pay of hand-tied bouquet with mass flowers, was $13.70 (Table 10). Three types of design, namely horizontal ($p < 0.0001$), triangle ($p < 0.0001$), and loose vase ($p = 0.0007$) showed significant increases in WTP compared with the baseline bouquet. Parallel designs showed a marginal increase of willingness to pay ($p<0.07$) of $1.66 compared with the baseline bouquet. Having mass flowers only, the willingness to pay of horizontal design was $29.45 ($p < 0.0001$), which was the highest among the five design types. Asymmetrical triangle designs had the second-highest willingness to pay, $13.99 ($p < 0.0001$), which was more than hand-tied bouquets with mass flowers only. The willingness to pay for loose vase design was $16.81 ($p = 0.0007$), followed by parallel designs, whose willingness to pay was $15.36. None of the three flower forms types significantly influenced willingness to pay for the inexpensive floral design ($20 price point) (Table 10).

At the $80 price point, willingness to pay for all four types of floral design differed significantly from the baseline design type, hand-tied bouquet (Table 11). Subjects expressed the highest willingness to pay $33.69 ($p < 0.0001$) for asymmetrical triangle design, followed by horizontal design ($33.13, $p < 0.0001$). Parallel design had a significant increase ($10.65) in willingness to pay ($28.33, $p < 0.0001$) compared with bouquet at this price point. The willingness to pay for loose vase design was $20.47 ($p = 0.0306$). For flower form type, line flower was mostly preferred and significantly

increased willingness to pay by $2.43 (p = 0.0352). No significant difference in willingness to pay was shown with the existence of filler and/or unique flowers (Table 11).

Table 10 Estimated coefficients for consumers' willingness to pay for design types and flower form types at $20 price point based on a Multiple Linear Regression model.

Variable	Estimate [z]	Standard Error	P-value
Intercept	13.70**	0.8202	< 0.0001
Floral design type			
Horizontal	15.75**	0.9171	< 0.0001
Triangle	13.99**	0.9171	< 0.0001
Loose vase	3.11**	0.9171	= 0.0007
Parallel	1.66	0.9171	0.07
Flower form type			
Line	-0.05	0.8202	0.9467
Filler	1.44	0.8202	0.0795
Unique	1.38	0.8202	0.0918
R^2	0.1698		
R^2 adjusted	0.1676		
Mean	21.63		
Number	131		
Observations	2620		

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Table 11 Estimated coefficients for consumers' willingness to pay for design types and flower form types at $80 price point based on a Multiple Linear Regression model.

Variable	Estimate [z]	Standard Error	P-value
Intercept	17.68**	1.1528	< 0.0001
Floral design type			
Horizontal	15.45**	1.2888	< 0.0001
Triangle	16.01**	1.2888	< 0.0001
Loose vase	2.79*	1.2888	= 0.0306
Parallel	10.65**	1.2888	< 0.0001
Flower form type			
Line	2.43*	1.1528	0.0352
Filler	0.83	1.1528	0.4718
Unique	1.25	1.1528	0.2775

Table 11 Continued, estimated coefficients for consumers' willingness to pay for design types and flower form types at $80 price point based on a Multiple Linear Regression model.

R^2		0.0946
R^2 adjusted		0.0922
Mean		29.21
Number		131
Observations		2620

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Willingness to pay of flower form: distributions

The willingness to pay distribution analysis was based on the original data because data transformation (log) did not improve the normality of data. A substantial amount of variability was seen in the willingness to pay distributions (Figure 30 and 31).

At $20 price point, the subjects' willingness to pay for the floral designs ranged from $0 to $200, with mean willingness to pay $21.63, standard deviation 16.27. 49.7% of the subjects were willing to pay a premium for the $20 floral designs, and 50.3% were willing to pay $20 or less for the designs. Therefore, at the $20 price point, about half of the subjects were priced out of the market (Figure 30).

As for the $80 price point, the subjects' willingness to pay ranged from $0 to $250, with mean willingness to pay $29.21, standard deviation 21.89 (Figure 31). Only 1.6% of the subjects would pay more than $80 for the floral designs while a majority of subjects, while 98.4% were willing to pay less. Therefore, the vast majority of subjects were priced out of the market (Figure 31).

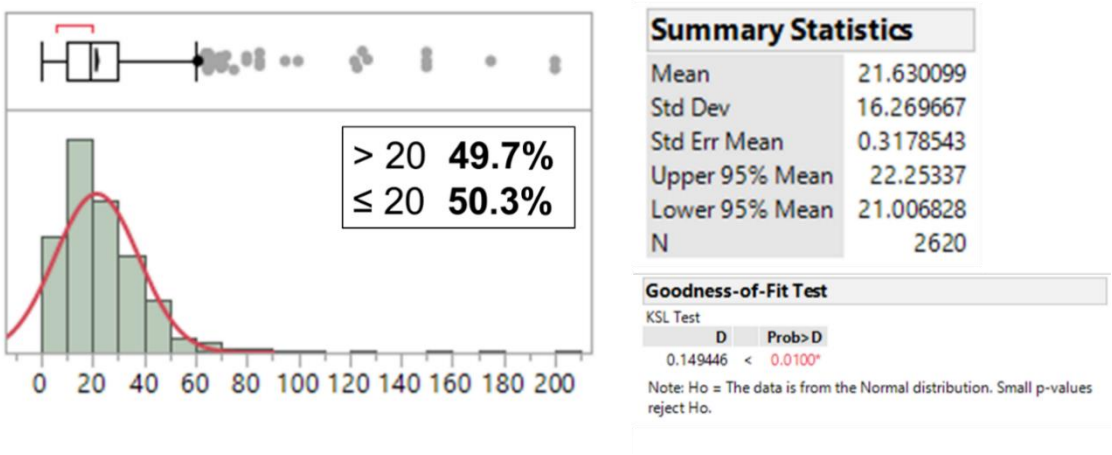


Figure 30 Distribution of willingness to pay for floral designs at $20 price point for flower form study.

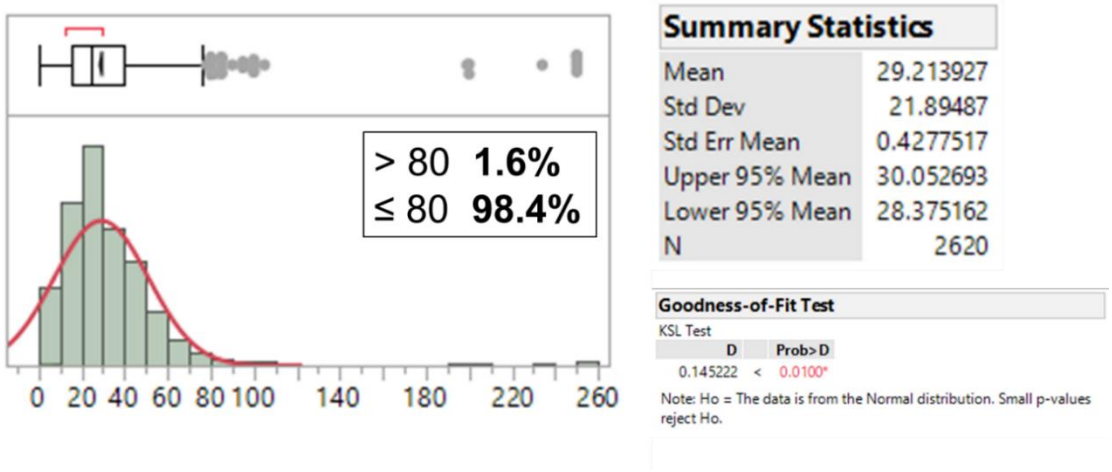


Figure 31 Distribution of willingness to pay for floral designs at $80 price point for flower form study.

Demographic comparisons of mean willingness to pay of flower form

Analysis of variance (ANOVA) test and Student's t-test were conducted to determine if there were statistically significant difference between demographic groups of their willingness to pay for the floral designs with different flower form types at $20

and $80 price points. Significant differences in subjects' willingness to pay for both inexpensive and expensive floral designs were found in comparisons of different demographic groups based on gender, age, education, annual income, race, and frequency of flower purchase ($p<0.0001$) (Table 12 and 13, Figure 32-43).

At both $20 and $80 price points, female subjects were willing to pay significantly more for the designs than males (Table 12 and 13, Figure 32 and 33). The mean willingness to pay for $20 designs by female subjects was $23.02, and $20.04 by male subjects (Table 12, Figure 32). As for $80 designs, female subjects were willing to pay for $32.04, while the mean willingness to pay by male was $25.97 (Table 13, Figure 33).

For age, respondents in the 65-74-year-old age group were willing to pay the most for the floral designs at both $20 and $80 price points, with mean willingness to pay $29.06 and $45.45, respectively, followed by 45-54 age group (Table 12 and 13, Figure 34 and 35). Even though the 65-74-year-old age group had the highest willingness to pay compared with other groups, the willingness to pay for floral designs at the $80 price point was still about half of the retail price of the designs. The mean willingness to pay for the 45-54 age group for the $20 floral designs was $23.12 (Table 12, Figure 34) and $31.51 (Table 13, Figure 35) for the $80 designs. No significant difference in willingness to pay was found between 35-44, 45-54, and 55-64 age group (Table 12 and 13, Figure 34 and 35). The youngest group, subjects aged between 18-34 years old, had the lowest willingness to pay for both $20 and $80 floral designs, with

mean willingness to pay $20.34 for the $20 designs, and $27.75 for the $80 designs (Table 12 and 13, Figure 34 and 35).

As for education level, generally, willingness to pay increased with the level of education (Table 12 and 13, Figure 36 and 37). Mean willingness to pay of subjects with graduate's degree were the highest in all groups for both $20 and $80 floral designs (Table 12 and 13, Figure 36 and 37). There was no statistically significant difference between mean willingness to pay of subjects with an Associate's degree and Bachelor's degree at either price point (Table 12 and 13, Figure 36 and 37). Subjects who have a high school diploma or professional certification had the lowest willingness to pay for both $20 and $80 floral designs (Table 12 and 13, Figure 36 and 37).

Subjects whose annual income is from $70,000-89,999 had the highest willingness to pay at $20 price point (Table 12 and 13, Figure 38 and 39). There were no statistically significantly different in willingness to pay amongst the other four groups at $20 price point (Table 12, Figure 38). People making less than 30,000 a year had the lowest willingness to pay at $20 price point (Table 12, Figure 38). At $80 price point, there was no statistically significant difference in willingness to pay amongst subjects who make $50,000-$69,999, $70,000-$89,999, and $90,000 or more annually (Table 13, Figure 39). Subjects whose annual income is $70,000-$89,999 were willing to pay more for $80 floral designs than those who make less than $49,999 a year (Table 13, Figure 39).

People who purchased flowers a few times weekly or monthly were willing to pay more for the designs at both $20 and $80 price points, compared with those who

purchased flowers a few times yearly or never purchased flowers (Table 12 and 13, Figure 40 and 41). We assume that people who frequently purchase flowers appreciate and value flowers more. At the lower price point, the mean willingness to pay of subjects who purchased flowers a few times weekly or monthly was $31.65, while that of the other groups were $20.65 (few times yearly) and $20.53 (never purchase flowers) (Table 12, Figure 40). At the $80 price point, the few times weekly or monthly flower purchase group also had the highest willingness to pay ($43.05) (Table 13, Figure 41). The mean willingness to pay of those who purchased flowers few times yearly was $28.17 and $26.76 for those who never purchase (Table 13, Figure 41).

For race, subjects in the category of "white" had the highest willingness to pay at both low- and high-end markets (Table 12 and 13, Figure 42 and 43). At the low-end market, there was no statistically significant difference in willingness to pay between Asian, African American/Black, or other races. The mean willingness to pay for the "white" group was $22.77 (Table 12, Figure 42). At the high-end market, the mean willingness to pay for the "white" group was $30.81, followed by Asian ($24.31) and subjects with other races ($19.80) (Table 13, Figure 43). At $20 price point, the mean willingness to pay for the African American/Black group was $13.77, and that at the $80 price point was $17.70 (Table 12 and 13, Figure 42 and 43).

Table 12 Willingness to pay mean separations, comparison between demographic groups at $20 price point.

Source	Num-ber	Obser-vation	Mean	Std Dev	Std Error	Range ($)	t test/ F test (p-value) [z]
Gender							-4.6602 (<.0001**)
Female	70	1400	23.0154	15.5476	0.4155	0-127	
Male	61	1220	20.0404	16.9278	0.4846	1-200	
Age							6.7649 (<.0001**)
18 – 34	50	1000	20.3355 c	14.5234	0.4593	0-127	
35 – 44	41	820	21.5129 bc	12.6417	0.4415	1-65	
45 – 54	19	380	23.1157 b	24.9117	1.2779	2-200	
55 – 64	17	340	22.3118 bc	14.1774	0.7689	3-72	
65 – 74	4	80	29.0600 a	22.8389	2.5535	3.99-95	
Education							9.4373 (<.0001**)
High school or professional certification	59	1180	18.4649 c	12.7821	0.7145	0.9-65	
Associate's degree	45	900	22.0445 b	18.8270	0.5481	0-200	
Bachelor's degree	11	220	21.1909 b	13.9758	0.4659	1-127	
Graduate degree	16	320	25.8082 a	13.5508	0.9136	3.99-72	
Annual Income							10.3094 (<.0001**)
Less than $30,000	40	800	19.7045 c	22.3290	0.9272	0-200	
$30,000-$49,999	35	700	20.6731 bc	15.9965	0.5656	0.9-127	
$50,000-$69,999	10	200	22.9414 b	12.3982	0.4686	1-72	
$70,000-$89,999	29	580	27.3650 a	13.3887	0.9467	10-65	
$90,000 or more	17	340	21.0935 bc	11.6787	0.6334	1-65	
Race							23.6204 (<.0001**)

Table 12 Continued, willingness to pay mean separations, comparison between demographic groups at $20 price point.

Asian	11	220	17.7354 b	10.0104	0.6749	0.9-45	
African American/B-lack	8	160	13.7719 b	11.6287	0.9193	0-48	
White	109	2180	22.7682 a	16.8702	0.3613	1-200	
Other	3	60	15.5167 b	13.8827	1.7923	4-50	
Frequency of Flower Purchase							52.0722 (<.0001**)
Few times weekly or monthly	12	240	31.6500 a	30.8008	1.9882	4-200	
Few times yearly	89	1780	20.6512 b	12.4384	0.2948	0.9-70	
Never	30	600	20.5263 b	16.5843	0.6771	0-127	

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Levels not connected by the same letter are significantly different.

Table 13 Willingness to pay mean separations, comparison between demographic groups at $80 price point.

Source	**Num-ber**	**Obser-vation**	**Mean**	**Std Dev**	**Std Error**	**Range ($)**	**t test/ F test (p-value) z**
Gender							-7.0726 (<.0001**)
Female	70	1400	32.0405	20.0960	0.5371	0-234	
Male	61	1220	25.9703	23.3830	0.6695	0-250	
Age							14.2280 (<.0001**)
18 – 34	50	1000	27.7546 c	20.0950	0.6355	0-234	
35 – 44	41	820	27.9745 bc	14.6322	0.5110	1.5-85	
45 – 54	19	380	31.5053 b	35.7123	1.8320	2-250	
55 – 64	17	340	30.1147 bc	16.8059	0.9114	0-85	
65 – 74	4	80	45.4475 a	29.9578	3.3494	5.99-105	
Education							5.8711 (<.0005**)

Table 13 Continued, willingness to pay mean separations, comparison between demographic groups at $80 price point.

High school or professional certification	59	1180	25.4809 c	16.8451	0.9417	2-100	
Associate's degree	45	900	29.2919 b	25.5042	0.7425	0-250	
Bachelor's degree	11	220	29.4103 ab	19.3204	0.6440	1-234	
Graduate degree	16	320	33.4218 a	15.7209	1.0599	5.99-76	
Annual Income							4.7369 (<.0001**)
Less than $30,000	40	800	27.5140 b	31.6934	1.3160	0-250	
$30,000-$49,999	35	700	28.0082 b	21.9501	0.7761	1-234	
$50,000-$69,999	10	200	29.7000 ab	14.4833	0.5474	2-76	
$70,000-$89,999	29	580	34.1600 a	15.8312	1.1194	10-75	
$90,000 or more	17	340	31.0406 ab	15.6874	0.8508	5-85	
Race							26.7617 (<.0001**)
Asian	11	220	24.3086 b	13.4656	0.9078	2-68	
African American/B-lack	8	160	17.7031 c	14.9770	1.1840	0-78	
White	109	2180	30.8129 a	22.7916	1.7513	0-250	
Other	3	60	19.8000 bc	13.5657	0.4881	5-60	
Frequency of Flower Purchase							55.9393 (<.0001**)
Few times weekly or monthly	12	240	43.0500 a	42.7358	2.7586	8-250	
Few times yearly	89	1780	28.1748 b	15.6525	0.3710	0-100	
Never	30	600	26.7622 b	23.5314	0.9607	0-234	

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Levels not connected by the same letter are significantly different.

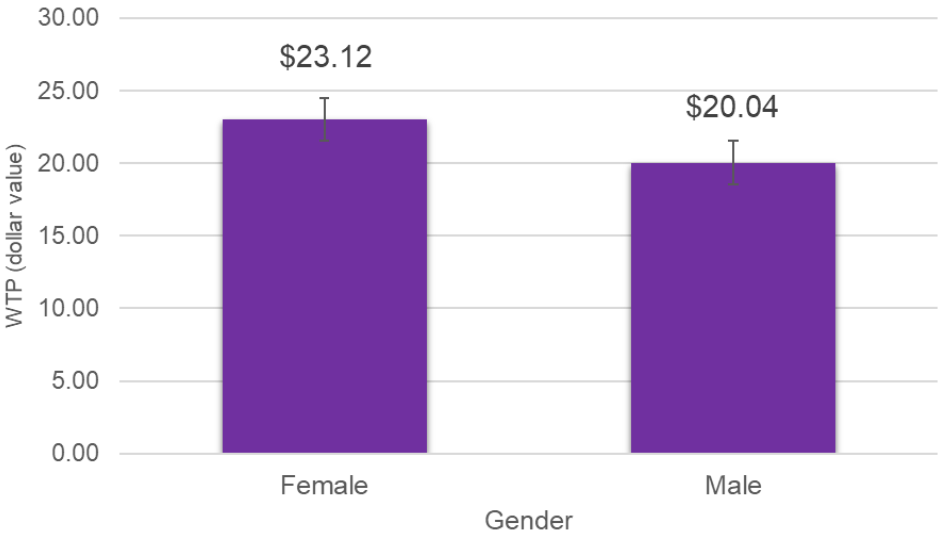


Figure 32 Mean willingness to pay comparison of $20 floral designs by gender for flower form study.

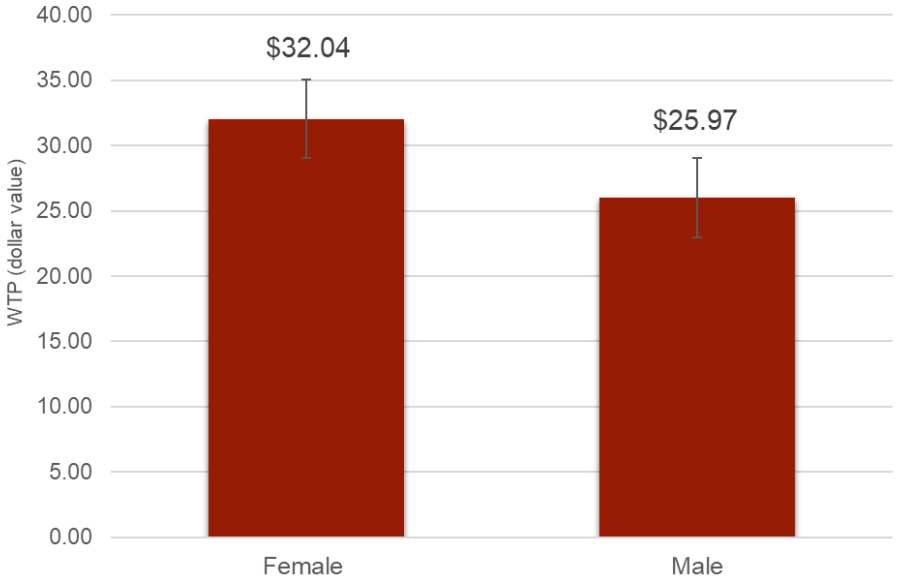


Figure 33 Mean willingness to pay comparison of $80 floral designs by gender for flower form study.

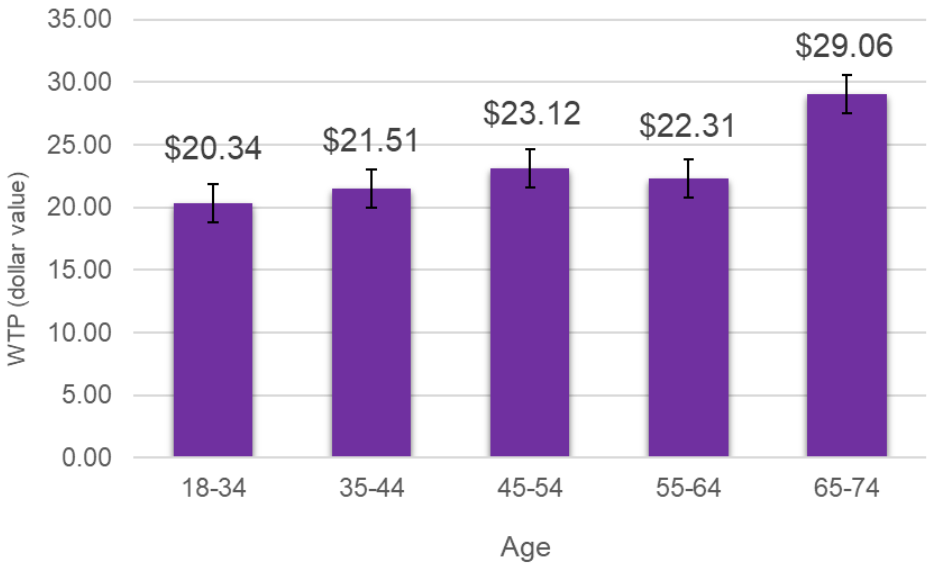


Figure 34 Mean willingness to pay comparison of $20 floral designs by age for flower form study.

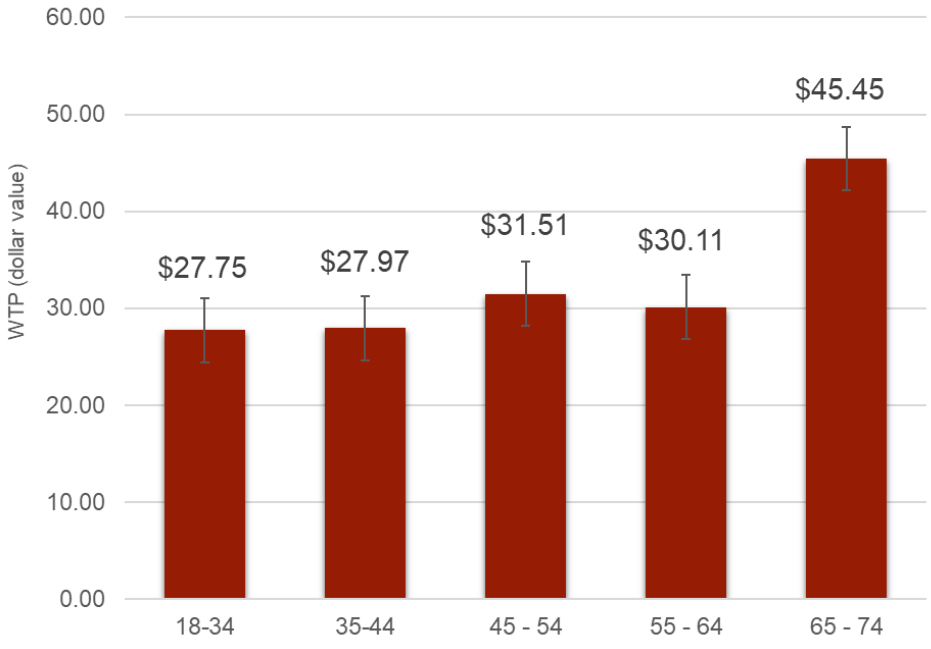


Figure 35 Mean willingness to pay comparison of $80 floral designs by age for flower form study.

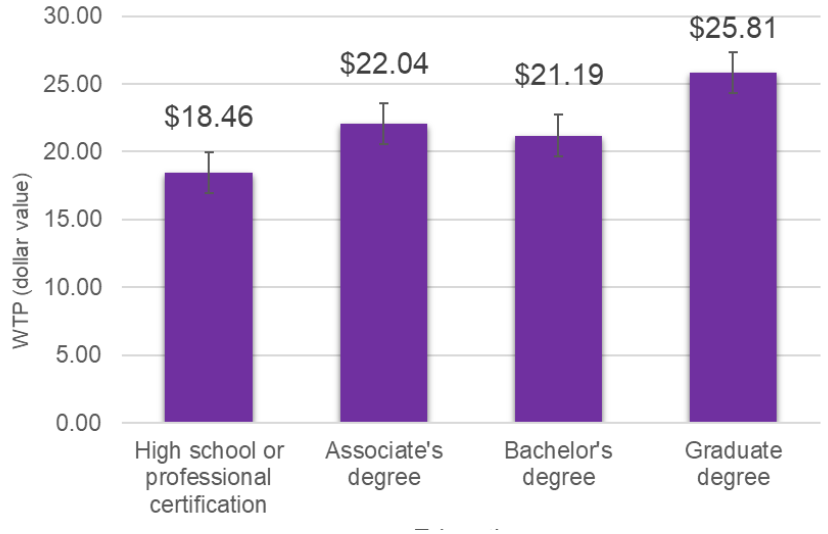


Figure 36 Mean willingness to pay comparison of $20 floral designs by education for flower form study.

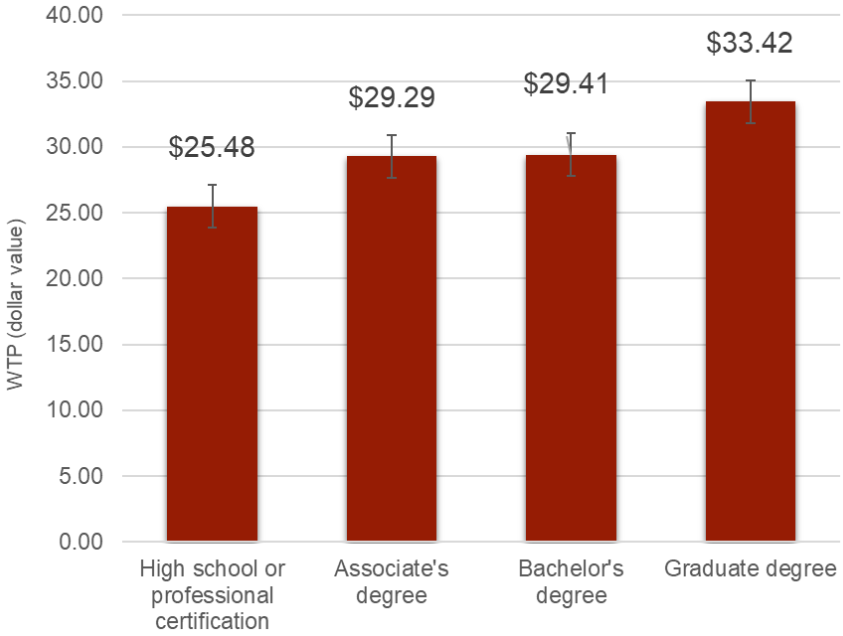


Figure 37 Mean willingness to pay comparison of $80 floral designs by education for flower form study.

Figure 38 Mean willingness to pay comparison of $20 floral designs by annual income for flower form study.

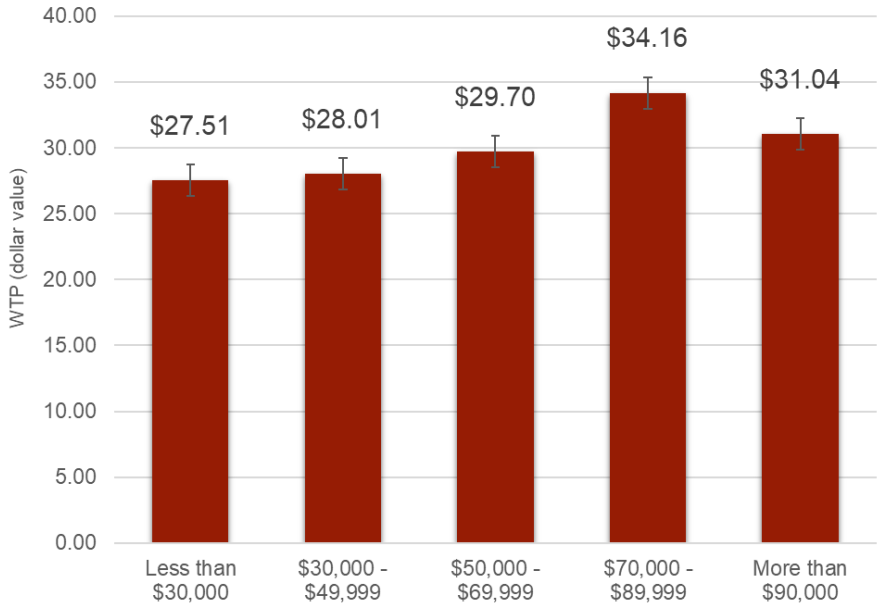


Figure 39 Mean willingness to pay comparison of $80 floral designs by annual income for flower form study.

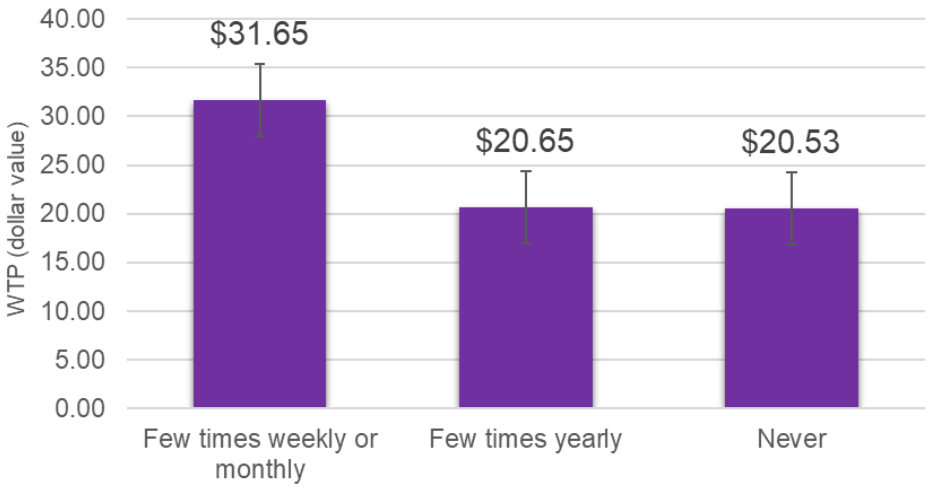


Figure 40 Mean willingness to pay comparison of $20 floral designs by frequency of flower purchase for flower form study.

Figure 41 Mean willingness to pay comparison of $80 floral designs by frequency of flower purchase for flower form study.

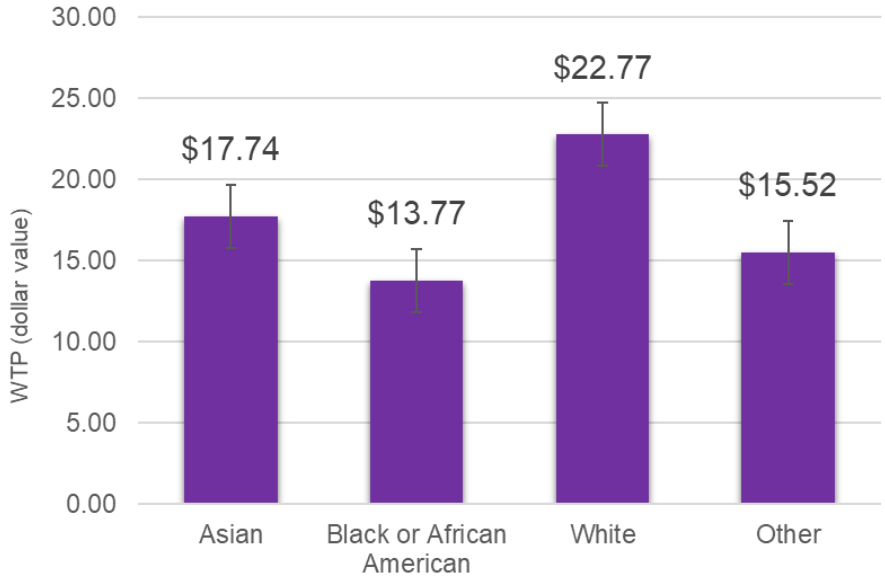


Figure 42 Mean willingness to pay comparison of $20 floral designs by race for flower form study.

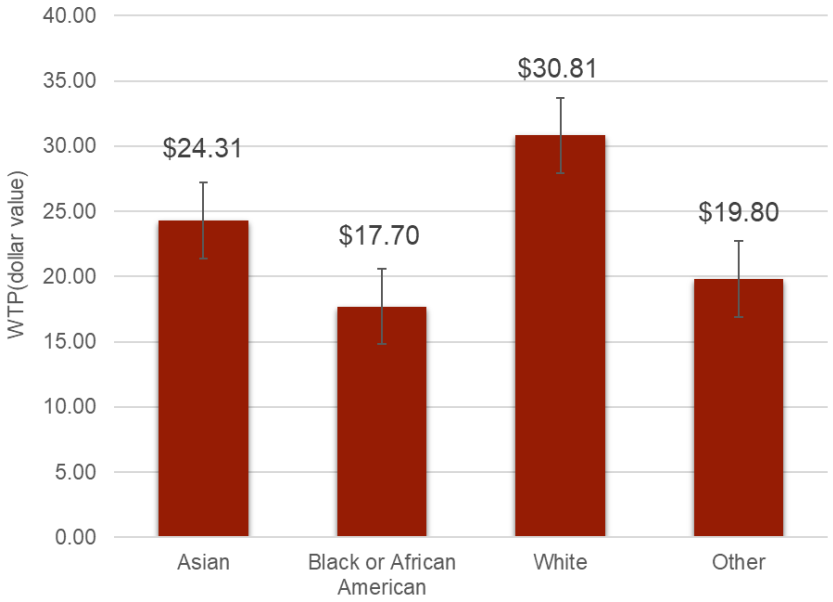


Figure 43 Mean willingness to pay comparison of $80 floral designs by race for flower form study.

Species substitution

A total of 131 people participated in this study, of whom 69 rated the bouquets with expensive species, and 62 rated the bouquets with inexpensive species. The demographic structure was the same as the flower form type study as the studies were built in the same online survey.

Nerine (when substituted for alstroemeria) costs about $12.50 per arrangement (5 stems) versus $3.35 for Alstroemeria (5 stems). There was no statistically significant difference in consumers' willingness to pay for the two bouquets or the attractiveness Likert scale rating of them (Table 14 and 15, Figure 44 and 45).

Ranunculus (when substituted for carnations) cost about $9.15 per arrangement (5 stems) versus $2.45 (5 stems) for carnation. No significant difference was found either in the mean willingness to pay, or attractiveness rating for either species (Table 14 and 15, Figure 44 and 46).

Double lisianthus (when substituted for roses) cost about $12.00 per arrangement (5 stems) versus $5.75 for rose (5 stems). No significant difference was found either in the mean willingness to pay, or attractiveness rating for either species (Table 14 and 15, Figure 44 and 47).

Dahlia (when substituted for chrysanthemums) cost about $23.19 per arrangement (5 stems) versus $5.50 (5 stems) for chrysanthemum. Again, the mean comparisons of willingness to pay and Likert scale attractiveness ratings between the two showed that our subjects rated them equally (Table 14 and 15, Figure 44 and 48).

Table 14 Willingness to pay mean comparison between expensive species and inexpensive species.

Species	Number	Mean	Std Dev	Std Error	Range ($)	t test (p-value)
Nerine vs Alstroemeria						-1.0789 (0.2826)
Nerine	69	29.2172	18.1473	2.1847	0-101	
Alstroemeria	62	32.6287	17.9978	2.2857	6-100	
Ranunculus vs Carnation						-0.3416 (0.7332)
Ranunculus	69	26.9274	18.1473	2.0713	0-85	
Carnation	62	27.9352	17.9978	2.1003	0-75	
Lisianthus vs Rose						-1.2027 (0.2313)
Lisianthus	69	26.5071	18.1473	1.9264	0-90	
Rose	62	29.9029	17.9978	2.0644	6.99-98	
Dahlia vs Football chrysanthemum						-1.5343 (0.1279)
Dahlia	69	21.8622	14.0807	1.6951	0-80	
Football chrysanthemum	62	26.4997	19.7052	2.5026	1-120	

Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

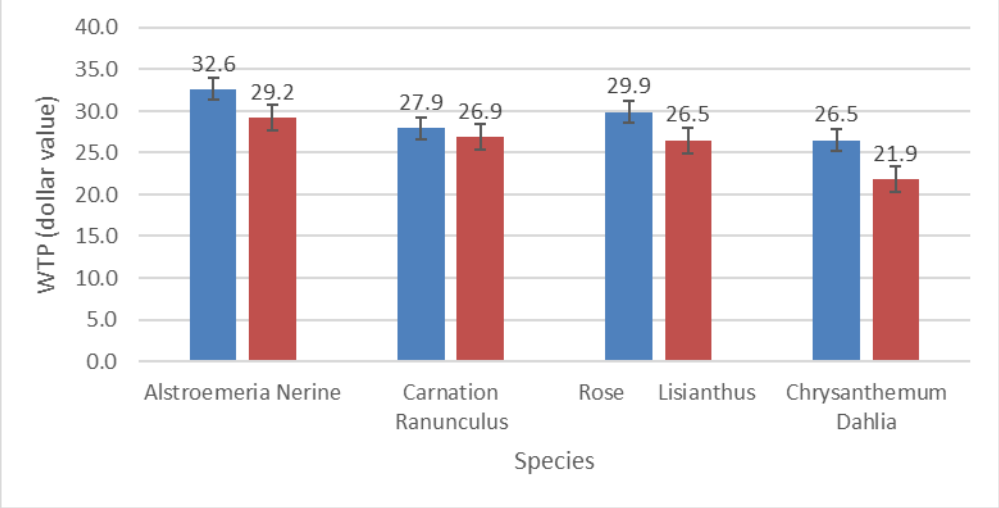


Figure 44 Willingness to pay mean comparison for all species for species substitution study.

Table 15 Likert scale rating comparison between expensive species and inexpensive species.

Species	Number	Mean	Std Dev	Std Error	t test (p-value)	Wilcoxon Rank Sums (p-value)
Nerine vs Alstroemeria					0.5162 (0.2826)	-0.1199 (0.9046)
Nerine	69	4.0725	0.8798	0.1059		
Alstroemeria	62	3.9839	1.9634	0.1351		
Ranunculus vs Carnation					-0.6578 (0.5118)	0.7669 (0.4418)
Ranunculus	69	3.6087	1.1404	0.1373		
Carnation	62	3.7419	1.1726	0.1489		
Lisianthus vs Rose					-1.7641 (0.0801)	1.5447 (0.1220)
Lisianthus	69	4.0435	1.0209	0.1229		
Rose	62	4.3226	0.7846	0.0996		
Dahlia vs Football chrysanthemum					0.1838 (0.8545)	-0.0705 (0.9438)
Dahlia	69	3.6812	1.1047	0.1330		
Football chrysanthemum	62	3.6452	1.1322	0.1438		

Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

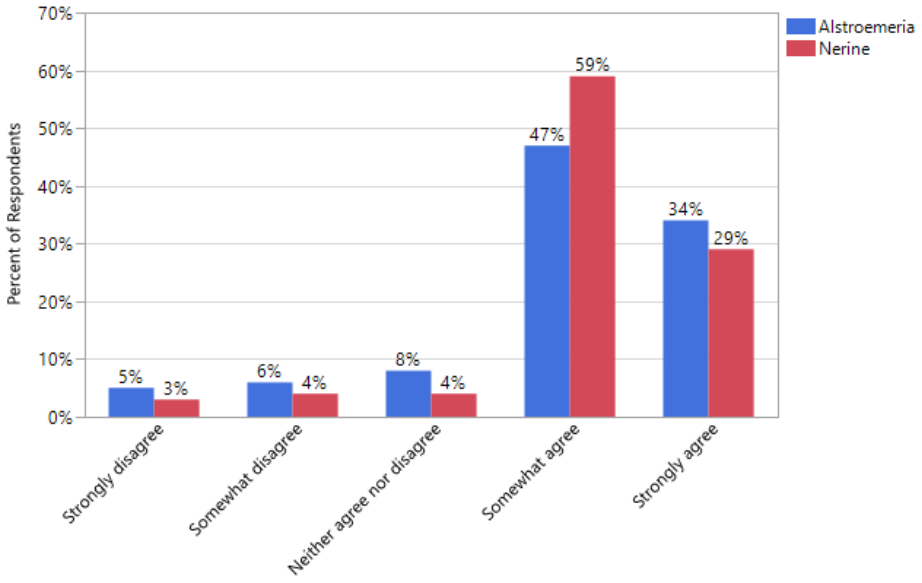


Figure 45 Likert scale frequency comparison of alstroemeria and nerine for species substitution study.

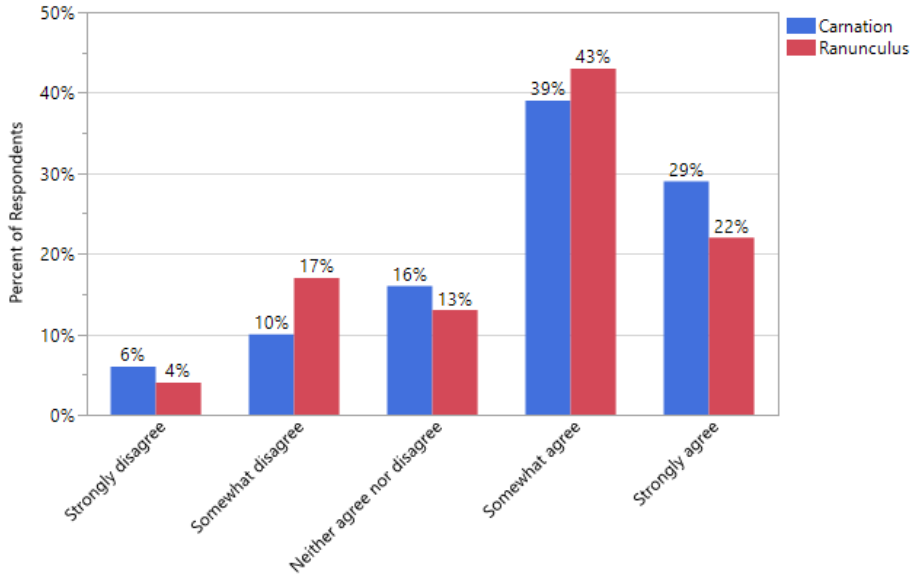


Figure 46 Likert scale frequency comparison of carnation and ranunculus for species substitution study.

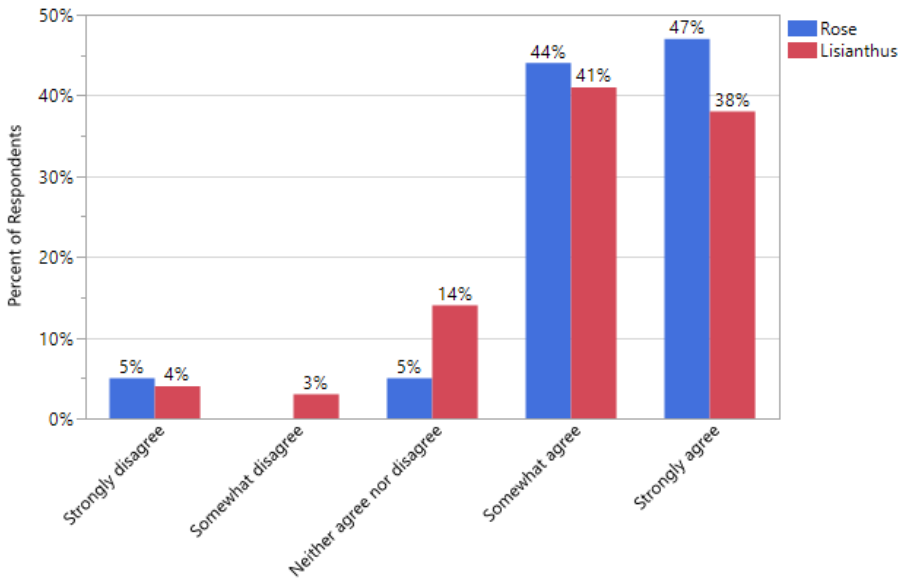


Figure 47 Likert scale frequency comparison of rose and lisianthus or species substitution study.

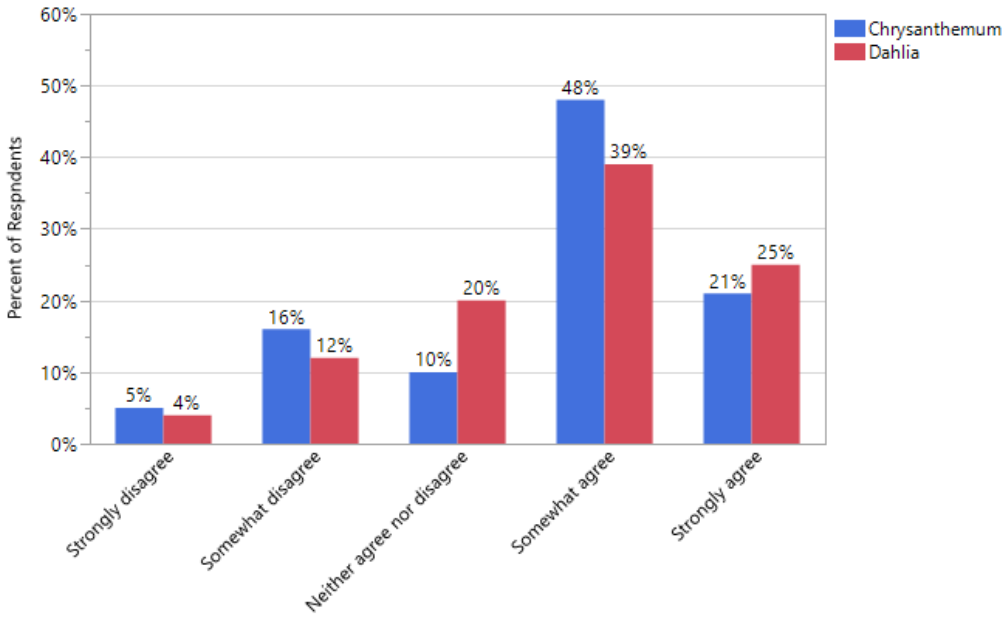


Figure 48 Likert scale frequency comparison of chrysanthemum and dahlia for species substitution study.

Flower symmetry

The number of subjects for this experiment was 131. The demographic structure was the same with flower form type, and species substitution studies as form type and species experiments were built in the same online survey.

Tukey's range test revealed that the perceived beauty of rose was rated the highest (4.36), followed by dahlia (3.84) and ranunculus (3.82) (Table 16, Figure 49). These three all fall into the radial symmetry group. Anthurium with bilateral symmetry was the least preferred with the lowest mean Likert scale rating (2.56) (Table 16, Figure 49).

The mean separation of three flower symmetry groups indicated that the radial symmetry group was the most preferred (3.77), followed by asymmetric flowers (3.19). The bilateral symmetry group was the least attractive symmetry group with mean Likert scale rating of 2.92 (Table 17, Figure 50).

Table 16 Likert scale rating comparison of individual flower symmetry.

Species	**Number**	**Mean**	**Std Dev**	**Std Error**	**F test (p-value)** [z]
					30.4137 (<.0001**)
Rose	131	4.3588 a	0.9288	0.0811	
Dahlia	131	3.8397 b	1.1276	0.0986	
Ranunculus	131	3.8244 b	1.2120	0.1059	
Calla lily	131	3.4504 bc	1.2039	0.1052	
Orchid	131	3.2748 cd	1.3362	0.1167	
Chrysanthemum	131	3.0000 cde	1.2026	0.1051	
Bird of paradise	131	2.9237 de	1.3337	0.1165	
Anthurium	131	2.5649 e	1.3132	0.1148	

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Levels not connected by the same letter are significantly different.

Table 17 Likert scale rating comparison of three flower symmetry groups.

Species	Number	Mean	Std Dev	Std Error	F test (p-value) z
					49.7419 (<.0001**)
Radial	655	3.7725 a	1.2952	0.0800	
Asymmetric	262	3.1870 b	1.3707	0.0858	
Bilateral	262	2.9234 c	1.2034	0.0470	

z Single (*) and double (**) asterisks are used to denote significance at the 0.05 and 0.01 levels, respectively.

Levels not connected by the same letter are significantly different.

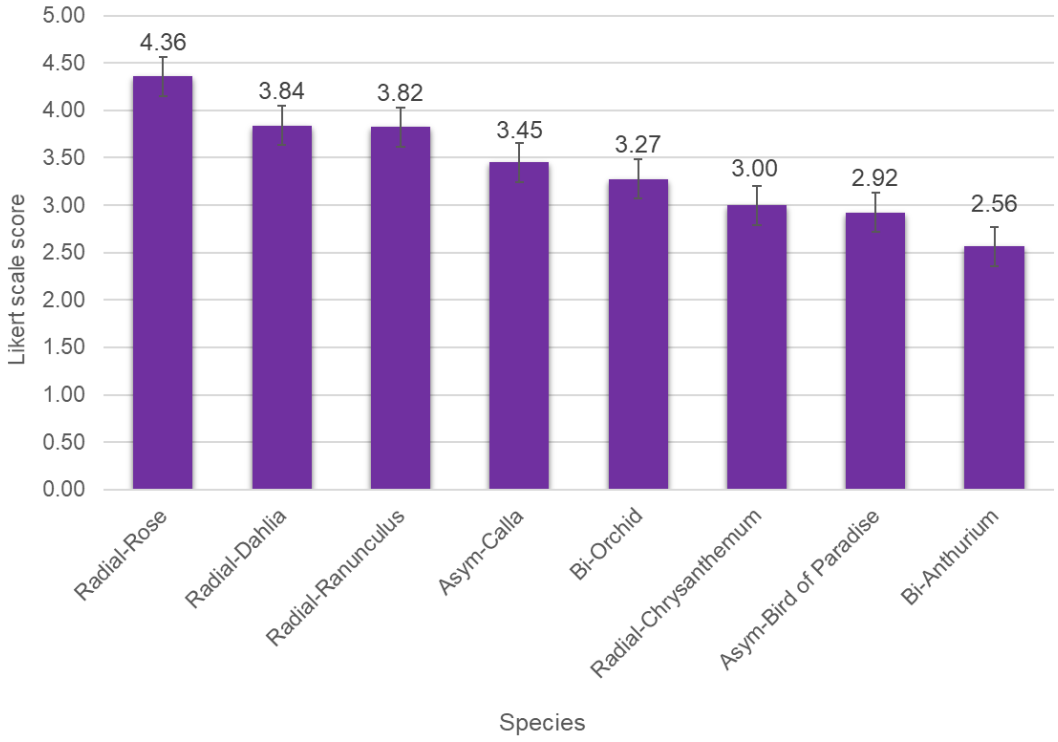


Figure 49 Likert scale beauty rating mean comparison of individual flower symmetry.

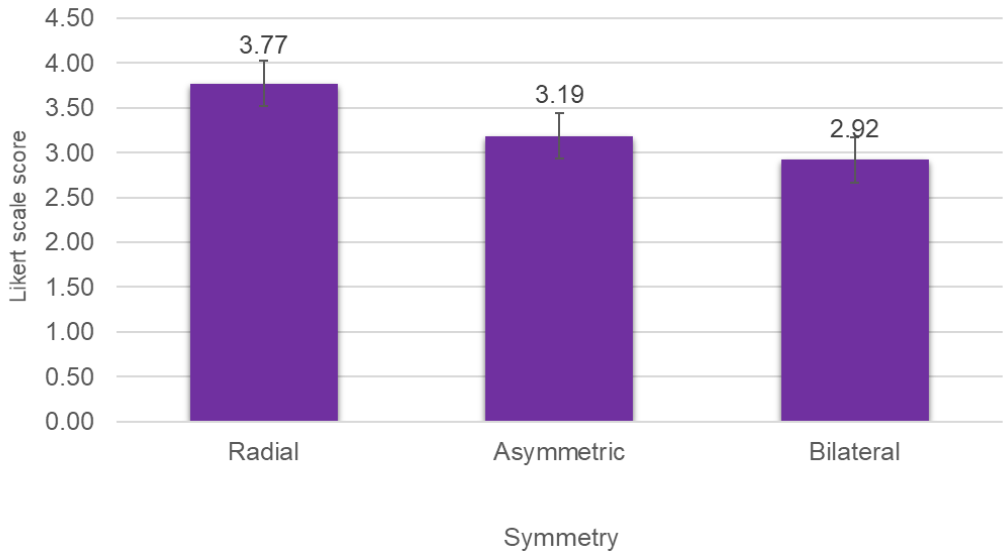


Figure 50 Likert scale beauty rating mean comparison of three flower symmetry groups.

Conclusions

Flower form

Even though designers can see the differences between $20 and $80 arrangements, consumers may not, based on the fact that their mean willingness to pay for the $80 floral designs is only $7.58 more than that of the $20 floral designs.

At both low and high price points, consumers placed the highest value in geometric designs, as seen in the greatest increase in willingness to pay for horizontal and asymmetrical triangle designs, which confirms that geometric design style is still highly preferred in the US as the typical American style. Loose vase designs had about the same change in willingness to pay at the two price points.

At the $20 price point, parallel design resulted in no change in willingness to pay compared to the baseline bouquet. None of the different forms of flower influenced

willingness to pay either. In other words, adding line, unique, or filler flowers to the mass flowers did not lead to an increase in profit for the arrangements at this price point.

At the $80 price point, however, parallel design increased willingness to pay significantly by $10.65. Adding line flowers in the $80 designs also significantly increased consumers' willingness to pay by $2.43. The significant increase in willingness to pay for both parallel design and line flower confirms consumer preferences for line in high-style designs as parallel design emphasizes the line element of floral design.

The mean willingness to pay for our $20 floral designs was $21.63. About half of the subjects were priced out of the market at this price point. The mean willingness to pay for the $80 floral designs was $29.21. At this price point, only 1.6% of the subjects were willing to pay more than $80. The majority of the subjects were priced out of the market.

There was statistically significant difference in willingness to pay between demographic groups at both low and high price points.

Species substitution

As no statistically significant difference was shown in either willingness to pay or beauty rating on Likert scale for any of the expensive and inexpensive species comparison groups, we could conclude that the selected expensive species could be substituted with less expensive species to increase profit margin.

We applied monochromatic color harmony for all the bouquets in this study. The bouquets with both expensive and inexpensive species (e.g., nerine and alstroemeria) were considered as mixed species. The ones with only inexpensive species (e.g., alstroemeria only) were considered mono species. As consumers rated them equally, consumers prefer and value mono-species and mixed-species bouquets in this study equally.

Flower symmetry

Rose was rated the highest on attractiveness, followed by dahlia and ranunculus. Anthurium was rated the lowest. No demographic differences were found for any of these flowers. Round and radial flowers are most commonly seen in nature. They are considered to be easy to recognize, and the most aesthetically appealing. Cultural influence may also explain why roses have the highest perceived beauty value, as rose is the national flower of the United States, which endows it with symbolic value in this culture.

The results of our study are consistent with previous studies. Radial flowers were considered most appealing, which may be due to the ease with processing, and peoples' preference for round objects over objects with sharp contours (Bar and Neta, 2006; Leder et al., 2011; Silvia and Barona, 2009; Westerman et al., 2012). Radially symmetrical flowers have the most axes compared with the other two symmetry groups in this experiment. The processing time shortens, and the preference increases with the increase in an object's axes of symmetry (Evans et al., 2000; Tinio and Leder, 2009).

Bilaterally symmetrical flowers had the lowest beauty rating. Bilateral flowers were less common and were generally perceived as difficult to recognize and categorize, which result in their low beauty rating (Hula and Flegr, 2016). According to Hula and Flegr (2016), some survey subjects in their study perceived bilateral flowers as bizarre.

CHAPTER VI

CONCLUSIONS

This research aims to provide information for floral industry participants to better cope with the challenges the industry has been facing, particularly the decline in both the employment of floral designers and sales of floral products in retail florist shops. The structural changes in the industry have dampened the demand for additional shops, and floral designers with formal education will have better prospects, according to the U.S. Bureau of Labor Statistics (BLS), 2018. Although entry-level floral design-related positions may only require a high school diploma or the equivalent, postsecondary training programs are recommended for those who wish to survive and thrive in the industry in the long run. From many professional floral designers' points of view, it is not hard to replicate ideas, but it's quite challenging to be innovative and stand out in the competitive industry without systemic learning of design elements, principles, techniques, as well as a good understanding of customers' expectations.

According to the 2019 Premium Report on Florists, there are proximately 12,000 businesses, with around 60,000 employees working in the floral industry in the United States. The industry is generally made up of small businesses with five employees on average. Floristry is a multi-disciplinary field. Industry practitioners have been playing critical roles in the industry and are expected to have a variety of knowledge and skills to help business grow and remain profitable. These knowledge and skills include, but are not limited to, horticulture, floristry practices, floral design, business, customer service,

education and training, professional presentation, and other design/artistic skills, which are developed mostly through education and training.

The educational and career pathways framework developed involves an integrated collection of programs intended to develop students' core academic, technical, and employability skills, provide them with various platforms for continuous education and training. This framework could assist individuals who are: 1) looking for a career; 2) interested in floral design in general and/or hoping to develop their career in the floral industry; or 3) floral designers who set career goals to become a professional floral designer, in various ways including, identifying a promising field and the routes they could take for their professional development, and thus building necessary competencies to prepare for a long-term career. For employers, the comprehensive educational and career pathways framework we developed could provide them with means for high-quality recruitment and training of new employees, upskill current employees, improve retention, and reduce turnover.

The occupational skills qualifications framework developed summarizes knowledge, skills, roles, and duties of various levels from beginning-to-master level floral designers along the educational and career pathways to achieve a certain level qualification. The framework provides detailed core competencies in ten categories that a floral designer should have to be qualified for being a designer of level, and it is also a very comprehensive framework. The development of the framework was based on occupational needs and career structure in the floral industry in the U.S. It took into account a range of frameworks and approaches used in other countries around the world.

The occupational skill qualifications framework could be used in both industry and academia, by all education and industry stakeholders, including employees, employers, educators, and students who desire to develop a career in the industry in various aspects. It could be used as a guideline in setting learning goals and evaluating learning outcomes for floral design classes, communicating expectations for knowledge and skills of employees, evaluating performance including both skills of individuals and the success of education and training programs in teaching those skills, encouraging changes in workplace practices to increase productivity and improving the quality of products and services produced in the industry and consequently promoting lifelong learning, and reducing industry unemployment rate.

The floral industry survey study on evaluating the practicality and likelihood of adoption of the frameworks received positive feedback from the opinion leaders in the floral industry, with 80-88% or more respondents expressing that they were likely or very likely to adopt the frameworks. Survey respondents are from all segments of the floral industry, playing various roles, including floral designer, business owner, educator, researcher, wholesaler, supplier, grower, etc. It's a collective decision-making process in the industry. Data analysis based on the feedback from industry leaders illuminated the strengths, weaknesses, and opportunities for improvement of the frameworks. The next steps are to adjust the two frameworks based on the results of our data analysis and then inform key education and industry stakeholders of the adjustments we've made to improve the practicality of the frameworks, which will potentially increase their adoption rate.

Planning for continuous improvement and sustainability of the frameworks is critical to ensure the long-term benefit of using the frameworks we developed. In addition to collaborating with leading organizations that are authorities in the industry, and whose members are opinion leaders in the industry, communications about these findings will be distributed to key industry stakeholders, namely, AIFD Education Partner schools, state floral associations, and higher education institutes that are part of the educational and career pathways, as well as key industry trade journals who play a crucial role in publicizing the framework and promoting the application of the frameworks by industry practitioners, students, and the general public. The information will also be provided to policymakers for them to understand better the current policies, funding streams, which are critical for the implementation of the framework.

In the long run, key industry stakeholders will be consulted to establish a timeline that describes the steps of implementation processes. Interviews, surveys, and in-depth case studies could be developed to evaluate the implementation processes, to evaluate how efficient and useful the framework we developed in helping those who are using our framework in the workplace. Additionally, milestones of the implementation processes could be identified to determine measures such as how many states have implemented the frameworks in 1 year, 5 years, and so on. Other analyses could measure and evaluate the effect of the frameworks on the labor market, measuring the employment rate of floral designers in a year, 5 years, and 10 years' time frame to see the efficacy of the frameworks.

The consumer research study provides a better understanding of, firstly, how flower forms in the design affect consumer's willingness-to-pay when browsing for a relatively inexpensive design versus when they look for an expensive design; secondly, how substituting expensive flower species with same color, similar look, and less expensive flowers affected consumers' willingness to pay for the floral designs and beauty ratings of them, as well as perceived beauty of flowers with three types of symmetry by consumers.

The market share of online retailers, supermarkets, and grocery stores have continued to grow due to their favorable lower-priced products and convenience. However, brick-and-mortar flower shops with upskilled employees providing superior customer services could differentiate themselves from other shopping channels. Arranged flowers represent the largest product segment in the industry. These products are sold mostly at retail flower shops, requiring specialized knowledge, skills, creativity to make and are mostly customized to meet various needs of customers, and therefore outpace the products provided by external competitors.

Product innovation, which brings in ideas, concepts, and innovative styles from other forms of art such as fashion, architecture, interior design, as well as design styles and techniques from other countries could potentially fend off competitors. Florists could also boost sales by combining flowers with other giftware such as wine, chocolate, balloons to attract younger customers (IBISWorld Report, 2019). Communicating the value of flowers beyond price is also an effective marketing strategy. Flowers provide various physiological, psychological, and cognitive well-being benefits to increase

happiness and quality of life, which also echoes the concept of "biophilia" (Hall and Knuth, 2019).

Even though baby-boomers are still key buyers of floral products as they have a higher level of disposable income compared to other generations, younger consumers are the future of the industry. Younger consumers who are more tech-savvy and educated about products and pricing have a higher demand for personalized products and services. They are also more eco-conscious and interested in "green living" and are willing to pay more for high quality, natural products. Therefore, internet and social media marketing strategies, along with following the "green movement" are crucial in attracting these customers (Sundale Research, 2018).

Experiential marketing is a growing trend that has also gained popularity in the floral industry. A new business form, called "the polymorphic industry", is emerging in some Asian countries such as China in recent years, which has largely increased interaction between business operators with customers. A boutique flower shop may also sell fashionable clothes and goods, artistically made coffee, provide a reading corner for customers who prefer to enjoy the peaceful ambient of a flower shop for some time than just stopping by and grabbing some flowers. Some shops even have a small-scaled flower farm behind the shop where customers can pick up flowers themselves, come back to the shop, and learn to make an arrangement with the assistance of the shop operators.

It is hoped that the findings from these research studies, and the joint efforts from all segments of the industry, will increase the overall competitiveness of the floral industry in the future.

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APPENDIX A

2019 FLORAL INDUSTRY STUDY EDUCATIONAL AND CAREER PATHWAYS AND OCCUPATIONAL SKILL QUALIFICATIONS

2019 FLORAL INDUSTRY STUDY
EDUCATIONAL AND CAREER PATHWAYS AND OCCUPATIONAL SKILL QUALIFICATIONS

Xuan (Jade) Wu AIFD, CFD, EMC

Department of Horticultural Sciences
Texas A&M University

Thanks for participating in our study!

My name is Jade Wu AIFD, CFD, EMC and I am a PhD student in the Department of Horticultural Sciences at Texas A&M University. Part of my dissertation research involves developing a framework that summarizes *educational and career pathways* that could be used as a mentoring tool for those considering floristry as a profession. This also requires summarizing the *occupational skill qualifications* for various levels along the educational and career pathway. The overarching goal of this research is to enhance the future competitiveness of the floral industry by enhancing our ability to attract new talented designers for the future. As professionals in the industry, your perspective is extremely valuable. We'd love to hear from you about the practicality of these two frameworks.

There are four parts of this survey booklet. Part I of the booklet is the educational and career pathway framework. Part II is the occupational skill qualifications framework. Part III includes a few short survey questions regarding the two frameworks. Lastly, Part IV gathers some general demographic information.

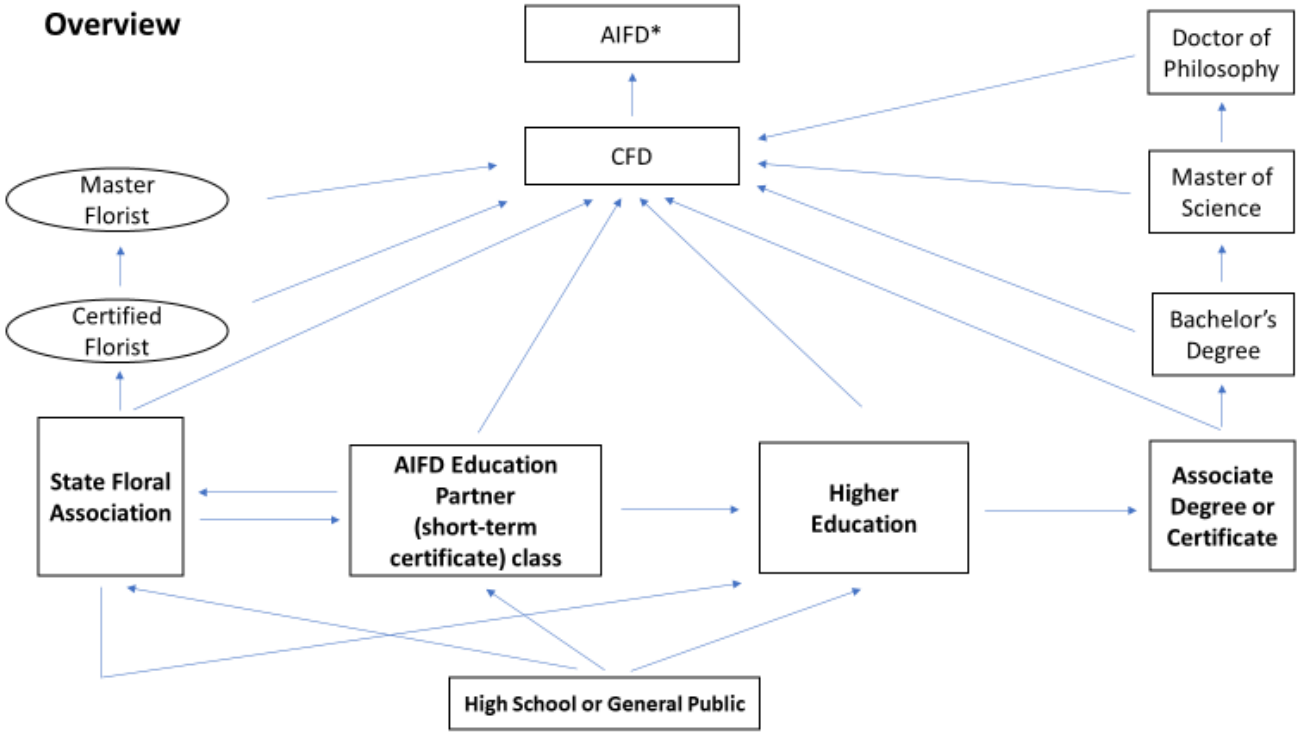
This survey takes about 10-15 minutes to complete. Your responses are completely anonymous. If you have any questions about the survey, please contact me **by phone** at 979-324-6543 or **by email** at jadexuanwu@gmail.com. You can return the survey booklet to me or to my advisor **Dr. Charles R. Hall** (c-hall@tamu.edu) upon completion of the survey.

We really appreciate your input!

PART I. Educational and Career Pathway Framework

Introduction

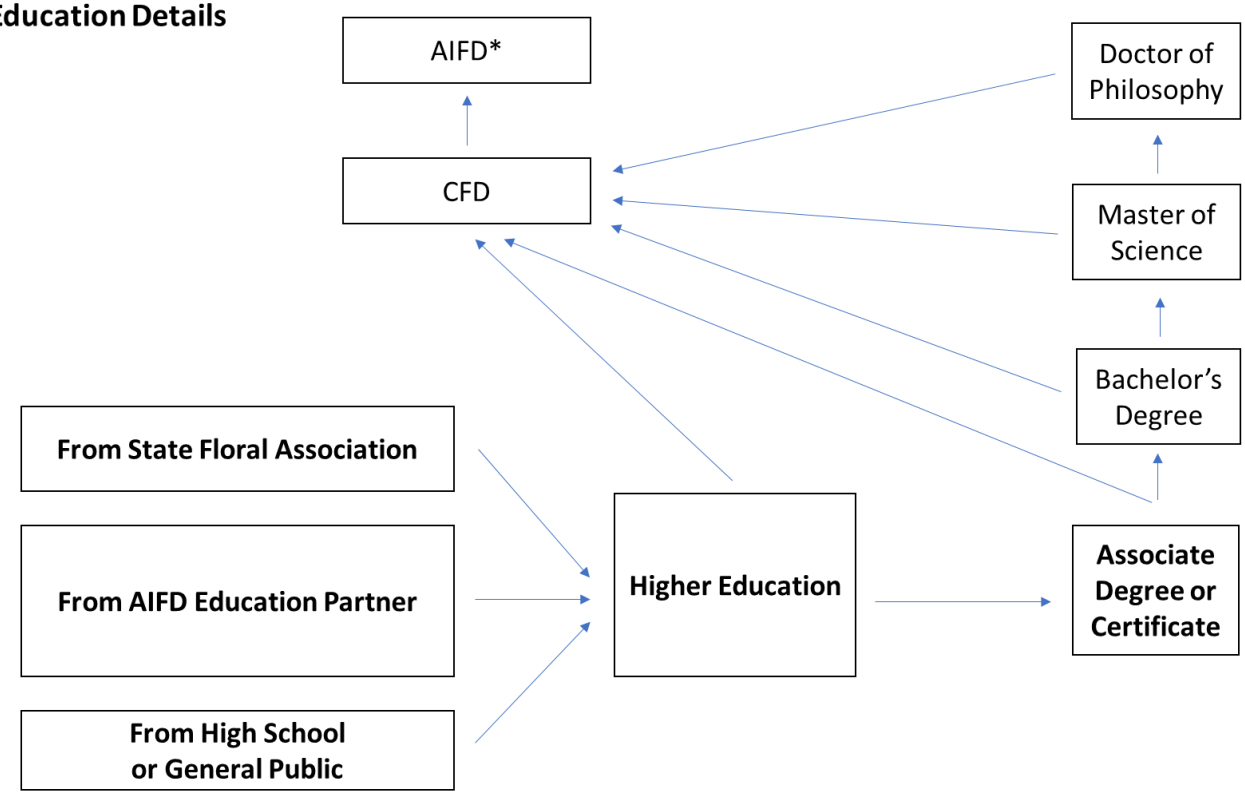
There are four educational and career pathway diagrams in this section. The first is an overview diagram with all possible educational and career pathway components. The next three diagrams focus on *higher education, AIFD partners* and *state floral association,* respectively. These diagrams show the detailed interconnections of major educational and career pathway components.



The overview diagram shows the interconnections of all educational and career pathway components. Entry-level positions require a high school diploma or the equivalent. Postsecondary training/education programs are provided by state floral associations, AIFD Education Partners and Higher Education Institutes. CFD could be achieved by completing the appropriate educational programs provided by an AIFD Education Partner, approved state floral association, Student American Institute of Floral Designers (SAIFD) Chapter, or during any stage of higher education. AIFD can only be obtained by achieving required scores in the Professional Floral Design Evaluation (PFDE). A person from the general public follows the same pathways as those who start after high school.

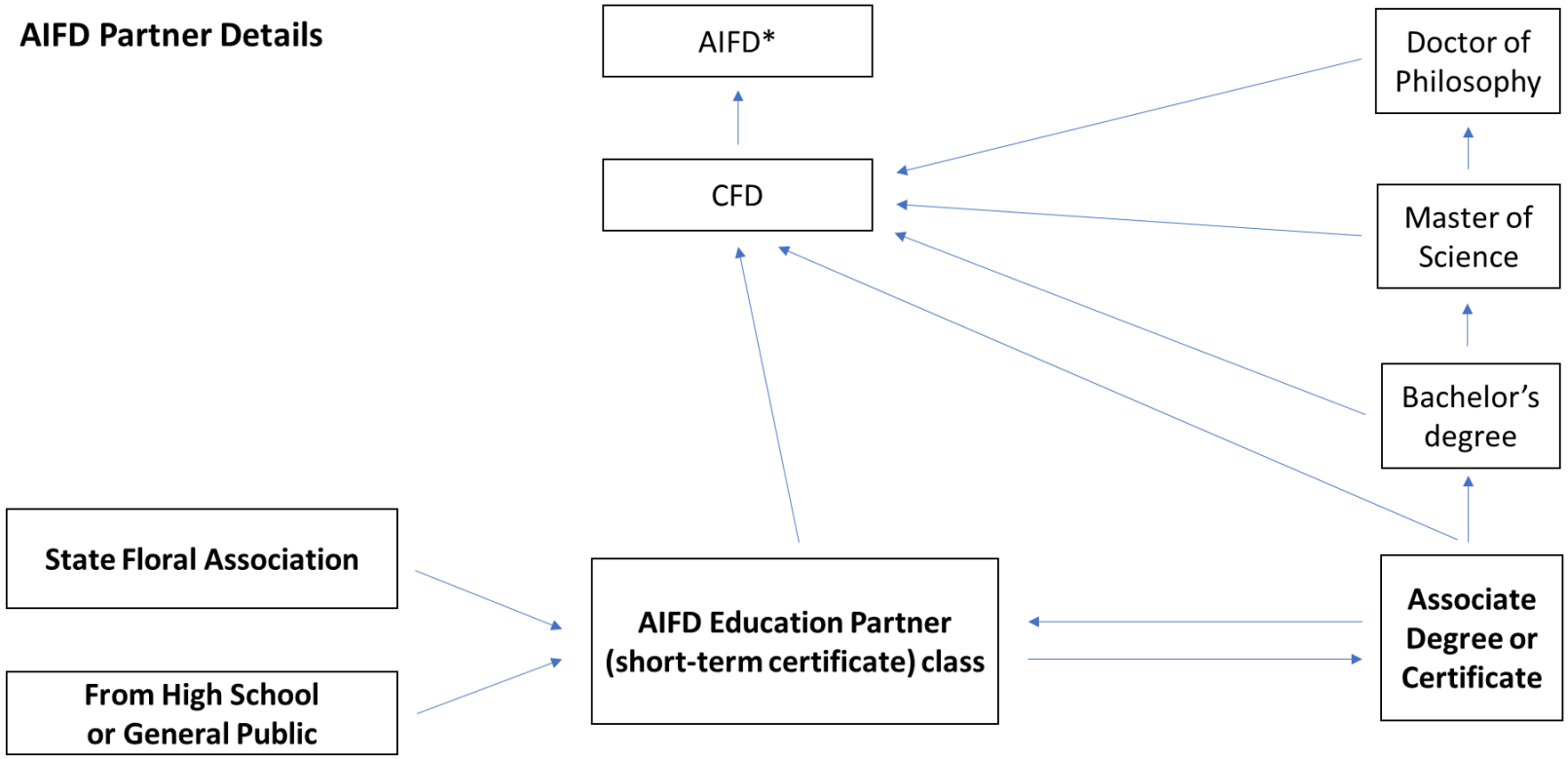
***** AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.

Higher Education Details



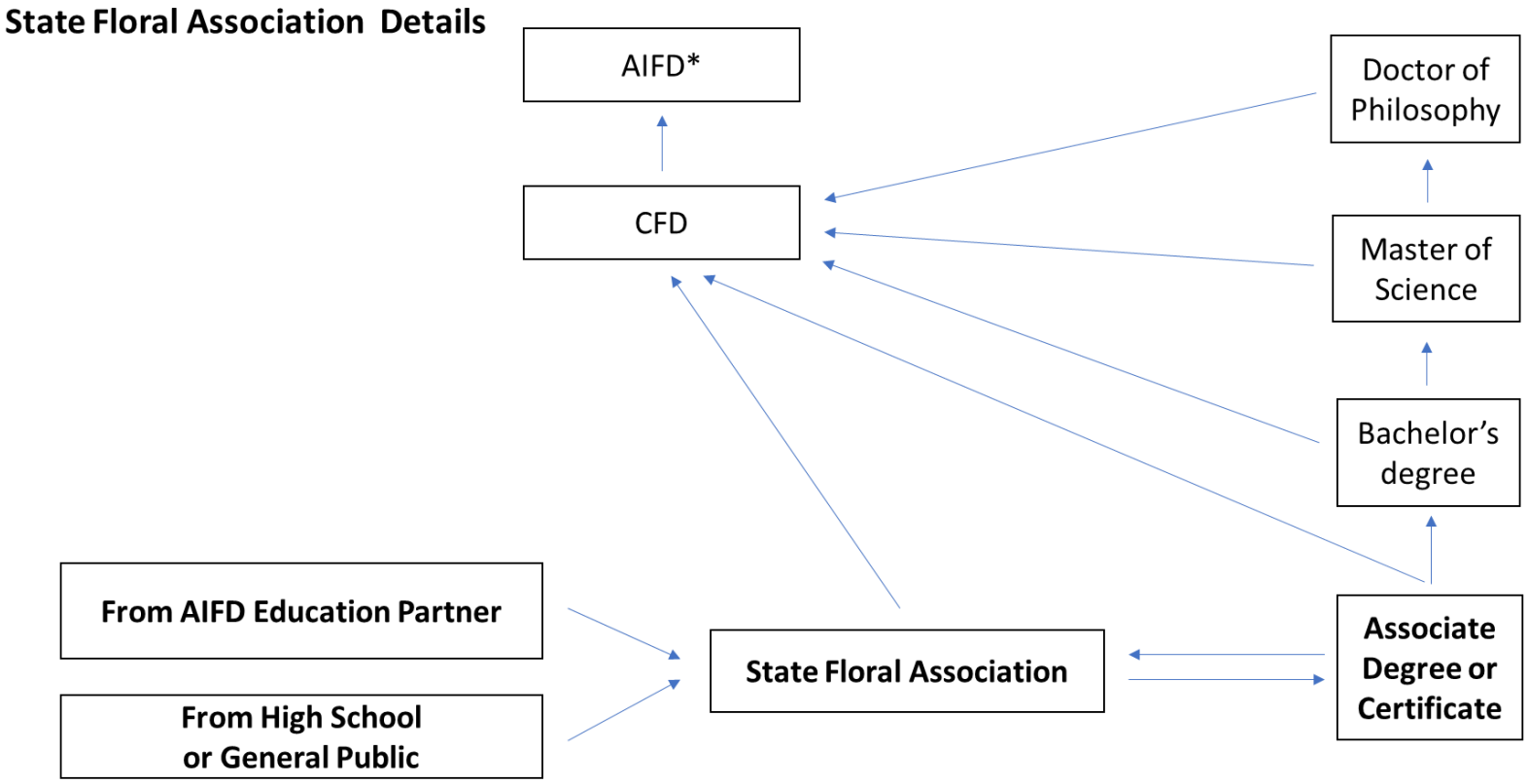
The diagram shows detailed connections between higher education and other pathway components. People who enter higher education institutions could be recent high school graduates, persons from the general public, or have a certification program background from a state floral association (e.g. The Texas State Floral Association provides high school certification programs.) or AIFD Education Partners. CFD and AIFD could be achieved during any stage of higher education.

* AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.



This diagram centers on AIFD Education Partners. People who go through educational programs offered by AIFD Education Partners can come from high school or the general public, and/or could have obtained certifications from state floral associations. CFD and AIFD could also be achieved during any stage of higher education.

* AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.



This diagram shows the pathways from state floral associations. People who attend education/training programs offered by state floral associations could be high school graduates or from the general public, and/or have a certification from an AIFD Education Partner. CFD and AIFD could also be achieved during any stage of higher education.

* AIFD does not restrict applicants to those only with a CFD credential. This framework is intended to show certifications and education levels.

PART II. Occupational Skill Qualifications Framework

Introduction

This section contains two tables. Table 1 describes the roles and duties of four levels of floral designers (*floral design assistant, floral designer, senior floral designer, master floral designer*). Table 2 identifies detailed occupational skill qualifications for basic-to master level floral designers. Corresponding core knowledge and skills of up to ten categories were described for each level floral designer. Educational and career pathways were also included in this framework.

Table 1. Roles and duties of floral design-related professions.

	Role	Knowledge & Skill level	Tasks/Work	Problem Solving Skills	Autonomy of work
Floral Design Assistant	This qualification reflects the role of floral design assistants who conduct simple tasks and create pre-determined designs.	They have basic general knowledge of floral design and limited range of basic floristry skills.	These individuals carry out mainly routine and repetitive tasks with limited and basic floral industry knowledge, skills and tools.	They could solve routine problems using simple methods and tools.	They work under direct supervision in a structured context.
Floral Designer	This qualification reflects the role of floral designers who use well-developed skills to design and sell a variety of floral products.	They have good knowledge, understanding, and skills of design elements, principles, techniques and their applications.	They take responsibility for completion of general tasks, they may also provide technical advice and support team members for improvement of the work.	They could solve problems by selecting and applying basic methods and tools.	They work with some independence and under limited supervision.
Senior Floral Designer	This qualification reflects the role of skilled senior floral designers who apply highly developed skills and creativity to design and sell a wide variety of high-style floral products.	They have comprehensive knowledge, skills of design techniques and deep understanding of elements and principles and their applications.	They take a lead role in coordinating the day-to-day operational, decision making processes and business activities.	They can solve unpredictable problems, manage complex technical or professional issues. They could develop creative solutions to difficulties.	They work independently and many floral designers at this level have supervisory responsibilities to plan, monitor and evaluate the work of team members. They also mentor and manage professional development of individuals and groups.

Master Floral Designer	This qualification reflects the role of highly skilled master designers who are capable of using specialized technical, conceptual skills, and innovative creativity to design and sell a diverse range of complex, high-style or themed floral products.	These designers have substantial depth of knowledge and the most advanced skills of design techniques and great execution of design elements and principles. They have critical awareness of trends in different fields.	They demonstrate substantial authority, innovation, and professional integrity and sustained commitment to the development of new ideas, products, techniques and trends at the forefront of the industry.	They could solve critical problems, integrate, extend and redefine existing knowledge or professional practice.	They work with significant autonomy, take responsibility for reviewing the strategic performance of the whole team.

Note: No occupational licensing, certification, or specific legislative requirements apply to these qualifications at the time of writing.

Table 2. Floristry Occupational Skill Qualifications

	Roles	Category	Core Knowledge & Skills
Certificate (short-term design class); **High school diploma or equivalent**; 	**Floral Design Assistant**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants
		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity
		Floral Design Skills	Basic application of design elements and principles; Utilize basic floral design techniques; Apply predetermined design ideas; Plan, prepare and construct fundamental floral arrangements; Check the quality of incoming floral products
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for stock
		Customer services	Interact with customers and take care of their needs; Sell floral products
		Design Skills	N/A[z]
		Event Planning & Designing Skills	N/A
		Business Skills	N/A
		Professional Presentation Skills	N/A
		Education & Training	N/A
Higher certificate (AIFD education partners; state floral association certified florist program); **Higher education degrees** (Associate degrees, BA or BS); **CFD**;	**Floral Designer**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants; **Limitations of plant use[y];** **Availability of plant varieties;** **Install and maintain plant displays**
		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity

		Floral Design Skills	Check the quality of incoming floral products **Good execution and application of design elements, principles, and various design techniques;** **Plan and create diverse floral designs;** **Create new design ideas above basic level**
		Design skills	**Drawing/Sketch skills to communicate ideas;** **Understanding of good photography skills;** **Understanding of good portfolio design skills;** **Understanding of good website design skills;** **Color uses of designs**
		Customer Services	Interact with customers and take care of their needs; Sell floral products; **Provide quality service to customers;** **Keep social media updated for customers and communicate with customers on social media**
		Business skills	**Provide quotations for floral products;** **Generate and implement marketing strategies;** **Sell and market floral products**
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for stock; **Order and maintain floral supplies and products**
		Event Planning & Designing Skills	**Assisting in planning and designing for special occasions or events;**
		Professional Presentation Skills	N/A
		Education & Training	N/A
Advanced certificate (State floral association master florist program; AIFD education partners);	**Senior Floral Designer**	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants; **Limitations of plant use;** **Availability of plant varieties;** **Install and maintain plant displays**

Higher education degrees (Associate degrees, BA or BS, MS, PhD); **CFD**; **AIFD** 		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity;
		Floral Design Skills	Check the quality of incoming floral products; Plan and create diverse floral designs; **Create complex and trendy floral design;** **Skillful application of design elements, principles and techniques;** **Develop innovative design ideas/concepts;** **Innovative ways of using floral products**
		Design skills	**Using software (photoshop, etc.) to communicate design ideas or freehand;** **Professional photography skills for floral design;** **Integrate advanced color theory into design processes;** **Good portfolio design skills;** **Good website design skills**
		Customer Services	Interact with customers and take care of their needs; Sell floral products; Provide quality service to customers; Keep social media updated for customers and communicate with customers on social media; **Manage customer expectations positively;** **Handling customer complaints**
		Business skills	Provide budget quotes for floral products; Generate and implement marketing strategies; Sell and market floral products; **Develop and implement a business plan and mission statement;** **Promote business image;** **Negotiate and make contracts with clients;** **Promote e-business and improve online sales and services;** **Keep accurate, up-to-date financial records;** **Lead and manage employees**
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for products; Order and maintain floral supplies and products; **Created innovative work environment**

Higher education degrees (Associate degrees, BA or BS, MS, PhD); **CFD**; **AIFD**; **May have other nationally and/or internationally recognized credentials**		Event Planning & Designing Skills	**Plan, coordinate, and design for special occasions or events;** **Create floral designs that fit in an assigned theme or appropriate for occasions;** **Work effectively with other professionals involved in the project**
		Education & Training	**Mentor in the workplace;** **Provide workplace skill instruction;** **Build and maintain good workplace relationships**
		Professional Presentation Skills	**Take care of shop presentation;** **Effective presentation and communication skills for floral showcase**
	Master Floral Designer	Horticultural Sciences	Identification and appropriate uses of cut materials; Maintain indoor plants; Limitations of plant use; Availability of plant varieties; Install and maintain plant displays
		Floristry Practices	Proper care and handling of fresh cut materials and plants for maximize longevity
		Floral Design Skills	Check the quality of incoming floral products; Plan and create diverse floral designs; Create complex and trendy floral design; Skillful application of design elements, principles and techniques; Develop innovative design ideas/concepts; Innovative ways of using floral products; **Implement global trends of the floral industry;** **Expand global trends for development and implement innovative floral products**
		Design skills	Using software (photoshop, etc.) to communicate design ideas or freehand; Professional photography skills for floral design; Integrate advanced color theory into design processes; Good portfolio design skills; Good website design skills; **Integrate various art forms (apply design concepts of other forms of design such as architecture, fashion design, etc.,) into floral design**

		Business skills	Provide budget quotes for floral products; Generate and implement marketing strategies; Sell and market floral products; Develop and implement a business plan and mission statement; Promote business image; Negotiate and make contracts with clients; Promote e-business and improve online sales and services; Keep accurate, up-to-date financial records; Lead and manage employees; **Market and manage business**
		Customer Services	Interact with customers and take care of their needs; Sell floral products; Provide quality service to customers; Keep social media updated for customers and communicate with customers on social media; Manage customer expectations positively; Handling customer complaints
		Support services	Maintain tools and equipment; Source information on products and services; Receive, store, and care for products; Order and maintain floral supplies and products; Created innovative work environment
		Event Planning & Designing Skills	Plan, coordinate, and design for special occasions or events; Create innovative floral designs that fit in an assigned theme or appropriate for specific occasions; Collaborate effectively with other professionals involved in the project; **Event management practices**
		Education & Training	Mentor in the workplace; Provide workplace skill instruction; Building and maintain good workplace relationships;
		Professional Presentation Skills	Take care of the shop presentation; **Effective presentation and communication skills for large-scale floral showcases such as conventions, symposiums, and trade shows**

[z] N/A = These skills are not necessarily required for that level.

[y] Bold font = These skills are in addition to the requirements for the previous level.

Part III. Survey

Floral Design Assistant

Q1. On a scale of 1 (not at all important) to 7 (extremely important), please rate the importance of the following skill sets applicable to a ***floral design assistant***:

	Not at all important						Extremely important
a. Horticultural Sciences	1	2	3	4	5	6	7
b. Floristry Practices	1	2	3	4	5	6	7
c. Floral Design Skills	1	2	3	4	5	6	7
d. Design Skills	1	2	3	4	5	6	7
e. Customer Services	1	2	3	4	5	6	7
f. Business Skills	1	2	3	4	5	6	7
g. Support Services	1	2	3	4	5	6	7
h. Event Planning & Designing Skills	1	2	3	4	5	6	7
i. Education & Training	1	2	3	4	5	6	7
j. Professional Presentation Skills	1	2	3	4	5	6	7

	Core knowledge & Skills
Horticultural Sciences	ID and appropriate uses of plants; Maintain indoor plants
Floristry Practices	Care and handling of plants for maximize longevity
Floral Design Skills	Basic application of elements, principles, techniques; Plan and construct fundamental designs; Quality check of floral products
Design Skills	Not required
Customer Services	Interact with customers and take care of their needs; Sell floral products
Business Skills	Not required
Support Services	Maintain tools and equipment; source information on products and services; Receive, store and care for stock
Event Planning & Designing Skills	Not required
Education & Training	Not required
Professional Presentation Skills	Not required

Floral Designer

Q2. On a scale of 1 (not at all important) to 7 (extremely important), please rate the importance of the following skill sets applicable to a ***floral designer***:

	Not at all important						Extremely important
a. Horticultural Sciences	1	2	3	4	5	6	7
b. Floristry Practices	1	2	3	4	5	6	7
c. Floral Design Skills	1	2	3	4	5	6	7
d. Design Skills	1	2	3	4	5	6	7
e. Customer Services	1	2	3	4	5	6	7
f. Business Skills	1	2	3	4	5	6	7
g. Support Services	1	2	3	4	5	6	7
h. Event Planning & Designing Skills	1	2	3	4	5	6	7
i. Education & Training	1	2	3	4	5	6	7
j. Professional Presentation Skills	1	2	3	4	5	6	7

	Core knowledge & Skills: Those of previous level PLUS…
Horticultural Sciences	Limitations of plant use; Availability of plant varieties; Install and maintain plant displays
Floristry Practices	Care and handling of plants for maximize longevity
Floral Design Skills	Good execution and application of elements, principles, techniques; Plan and create diverse designs; Create new design ideas above basic level
Design Skills	Drawing/sketch to communicate ideas; Understanding of good photography, portfolio design, web design skills; Color uses of designs
Customer Services	Quality service; Social media updates and communicate with customers on social media
Business Skills	Provide quotations for floral products; Generate and implement marketing strategies; Sell and market floral products
Support Services	Order and maintain floral supplies and products
Event Planning & Designing Skills	Assisting in planning and designing for events
Education & Training	Not required
Professional Presentation Skills	Not required

Senior Floral Designer

Q3. On a scale of 1 (not at all important) to 7 (extremely important), please rate the importance of the following skill sets applicable to a ***senior floral designer***:

	Not at all important						Extremely important
a. Horticultural Sciences	1	2	3	4	5	6	7
b. Floristry Practices	1	2	3	4	5	6	7
c. Floral Design Skills	1	2	3	4	5	6	7
d. Design Skills	1	2	3	4	5	6	7
e. Customer Services	1	2	3	4	5	6	7
f. Business Skills	1	2	3	4	5	6	7
g. Support Services	1	2	3	4	5	6	7
h. Event Planning & Designing Skills	1	2	3	4	5	6	7
i. Education & Training	1	2	3	4	5	6	7
j. Professional Presentation Skills	1	2	3	4	5	6	7

	Core knowledge & Skills: Those of previous level PLUS…
Horticultural Sciences	ID, uses, maintain, limitations, availability of plants; Install and maintain of plant displays
Floristry Practices	Care and handling of plants for maximize longevity
Floral Design Skills	Create complex and trendy floral design; Skillful application of design elements, principles and techniques; Develop innovative ideas; Innovative uses of products
Design Skills	Using software or freehand to communicate ideas; Professional photography, portfolio design and web design skills; Advanced color uses
Customer Services	Manage customer expectations positively; Handling customer complaints
Business Skills	Develop and implement business plan; Promote business image; Negotiate with clients; E-business and promote sales and services; Keep financial records; lead and manage employees
Support Services	Create innovative work environment
Event Planning & Designing Skills	Plan, coordinate and design for events; Create designs for assigned theme or occasions; Work with other professionals involved in the project
Education & Training	Mentor in the workplace; Provide workplace skill instruction; Build and maintain good workplace relationships
Professional Presentation Skills	Take care of shop presentation; Effective presentation and communications for floral showcase

Master Floral Designer

Q4. On a scale of 1 (not at all important) to 7 (extremely important), please rate the importance of the following skill sets applicable to a ***master floral designer***:

	Not at all important						Extremely important
a. Horticultural Sciences	1	2	3	4	5	6	7
b. Floristry Practices	1	2	3	4	5	6	7
c. Floral Design Skills	1	2	3	4	5	6	7
d. Design Skills	1	2	3	4	5	6	7
e. Customer Services	1	2	3	4	5	6	7
f. Business Skills	1	2	3	4	5	6	7
g. Support Services	1	2	3	4	5	6	7
h. Event Planning & Designing Skills	1	2	3	4	5	6	7
i. Education & Training	1	2	3	4	5	6	7
j. Professional Presentation Skills	1	2	3	4	5	6	7

	Core knowledge & Skills: Those of previous level PLUS…
Horticultural Sciences	ID, uses, maintain, limitations, availability of plants; Install and maintain of plant displays
Floristry Practices	Care and handling of plants for maximize longevity
Floral Design Skills	Implement global trends; Expand global trends for development and implement innovative floral products
Design Skills	Integrate various art forms architecture, fashion design, etc.,) into floral design
Customer Services	Manage customer expectations positively; Handling customer complaints
Business Skills	Market and manage business
Support Services	Maintain tools and equipment; source information on products and services; Receive, store and care for stock; Order and maintain floral supplies and products; Create innovative work environment
Event Planning & Designing Skills	Event management practices
Education & Training	Mentor in the workplace; Provide workplace skill instruction; Build and maintain good workplace relationships
Professional Presentation Skills	Effective presentation and communications for large scale floral showcases

Q5. Please rate the likelihood that you might use the ***educational and career pathway*** framework in assisting individuals in identifying a promising field, guiding yourself for professional development, upskilling employees, and/or maintaining sustained growth of the industry:

Please rate the likelihood that you might use the educational and career pathway model for one or more of the above stated purposes				
Very unlikely 1	2	3	4	Very likely 5

Q6. Please rate the likelihood of using the ***occupational skill qualifications*** framework in promoting learning process and training investment, communicating expectations for skills, evaluating skills, education and training programs, and raising workforce skills for the industry:

Please rate the likelihood that you might use the occupational skill qualifications model for one or more of the above stated purposes				
Very unlikely 1	2	3	4	Very likely 5

Q7. Please provide any suggestions for improving the ***educational and career pathway*** framework:

Q8. Please provide any suggestions for improving the ***occupational skill qualifications*** framework:

Q9. Please select the membership(s)/credentials you own:

- AIFD
- SAF
- Both
- Other_____

Part IV. Demographics

Gender	☐Male	☐Female
Age (years)	☐18-30 ☐31-40 ☐41-50	☐51-60 ☐61-70 ☐71 or over
Education	☐Less than a high school diploma ☐High school diploma or GED ☐Some college, no degree ☐Associate's degree ☐Bachelor's degree ☐Graduate degree	
Job position in the floral industry (please select the most appropriate position title)	☐Wholesale floral designer ☐Retail floral designer ☐Freelance floral designer ☐Floral manager ☐Floral design educator/researcher ☐Retail florist ☐Wholesaler/Importer ☐Supplier/manufacturer ☐Grower ☐Event-only florist ☐Student Others, please specify_____	

How many years have you been working in the floral industry?	☐0-5 ☐6-10 ☐11-20	☐21-30 ☐31-40 ☐41 or over
Where in the US do you live? (State)	_____	

Thank you for your participation!

Please return the completed survey booklet by:

- contacting me via **text message** (979-324-6543) or **email** (jadexuanwu@gmail.com)

or

- returning the booklet to my advisor **Dr. Charles R. Hall** (c-hall@tamu.edu)

or

- returning the booklet to the **designated boxes** at the registration desk.

Thank you!

APPENDIX B

FLOWER FORM AND SPECIES SURVEY STUDY

Consent Form

Survey Consent

We are asking for your voluntary participation in a research study to learn about how consumers perceive floral designs and individual flowers. As researchers, we are required to provide this consent form to inform you about the study, to convey that your participation is voluntary, to explain the risks and benefits of participation, and to empower you to make an informed decision about your participation. Please feel free to telephone or email and ask us any questions you may have.

The purpose of this study is to better understand consumer preferences for flower forms and species. We will ask approximately 1000 people to participate. Your participation in this study will take approximately 2030 minutes, including the time to read this consent form.

If you agree to participate in the study, please click on the box below. Upon giving consent, you will be asked to answer a series of questions related to pictures of floral design.
You will not benefit directly from your participation in this study; however, your participation in this study may lead to a better understanding of how people evaluate floral design and beauty of flowers. There are no foreseeable risks associated with your participation in this study.
The data for this project are being collected confidentially. Your answers will be separated from any identifiers and then neither the researchers nor anyone else will be able to link your responses to you as an individual.

Participation in this research project is completely voluntary. You may withdraw from the study or choose not to answer specific questions or to stop participating at any time without penalty, but please try to answer every question.

According to the Amazon Mechanical Turk Policy, "a Requester may reject your work if the HIT was not completed correctly or the instructions were not followed". If you do not pass the attention checks in this survey, your work will be rejected and you will not be paid. Please read the survey carefully.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact Dr.
Charles R. Hall at c-hall@tamu.edu, 979-255-0795 or at 2133 Horticulture Sciences and Forestry Building, Room 216, College Station, TX 77845.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Texas A&M University's Human Research Protection Program at 979-458-

4067, or email irb@tamu.edu or regular mail at General Services Complex, Suite 2701, TAMU, College Station, TX 77845.

Every question is important to us and we thank you, in advance, for your participation.

- ◯ I agree to participate in the study
- ◯ I do not wish to participate in the study

Horizontal $20

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

How much would you be willing to pay for this arrangement?
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How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Hand-tied bouquet $20

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

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How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Attention check Q1

Please put "lily" in the box below

Asymmetrical triangle $20

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

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Loose vase $20

How much would you be willing to pay for this arrangement?
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Parallel $20

How much would you be willing to pay for this arrangement?
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Horizontal $80

How much would you be willing to pay for this arrangement?
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How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Attention check Q2

Please check the box to authenticate you are not a robot.

I'm not a robot

reCAPTCHA
Privacy - Terms

Hand-tied bouquet $80

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

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Parallel $80

How much would you be willing to pay for this arrangement?
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(Please insert dollar value only, do not add dollar sign)

Attention check Q3

Please put "abc" in the box below

Species- Original

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

Species- Sub

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

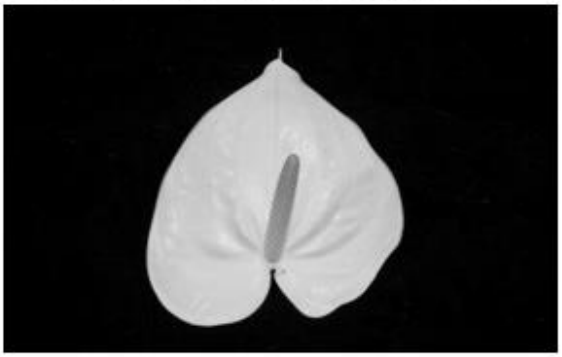
	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

How much would you be willing to pay for this arrangement?
(Please insert dollar value only, do not add dollar sign)

Is this floral arrangement aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this floral arrangement aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?



	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

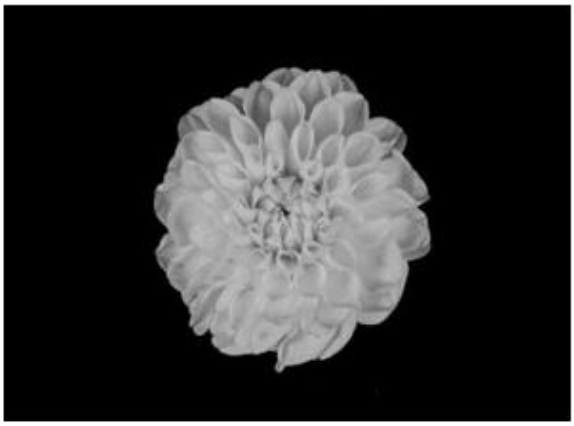
Is this flower aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?



	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Is this flower aesthetically appealing to you?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Is this flower aesthetically appealing to you?	○	○	○	○	○

Demographics

How often do you buy flowers?

Few Times Weekly

Few Times Monthly

Few Times Yearly Never

Never

What is your favorite color?

What is your sex?

Female

Male

What is your age?

18 - 24

25 - 34

35 - 44

45 - 54

55 - 64

65 - 74

75 - 84

85 or older

What is your race?

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Other

What is your level of education?

Less than high school

High school graduate/GED

Some college

2 year degree

4 year degree

Masters

Doctorate

Professional Certification

What is your family's annual income?

Less than $20,000

$20,000 - $29,999

$30,000 - $39,999

$40,000 - $49,999

$50,000 - $59,999

$60,000 - $69,999

$70,000 - $79,999

$80,000 - $89,999 $90,000 - $99,999

$100,000 - $149,999

More than $150,000