Evaluation of a Multimedia Digital Art Course for Older Adults

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2018

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Abstract

This process evaluation was conducted on a multimedia digital art course for older adults at an independent living facility. Smartphones were used for photography, photo editing, digital scrapbooking, videography, and augmented reality (AR). This process evaluation aimed to identify opportunities and challenges of this pilot course as an addition to existing programming. It aimed to determine if the pilot course was suitable and enjoyable for participants and volunteers, run efficiently, and capable of advancing the mission of the primary arts in health organization involved. Additionally, it proposed best practices for multimedia digital art courses with older adults in the future. This process evaluation was conducted with a mixed methods approach, pragmatic worldview, convergent parallel mixed methods design, and inductive content analysis methodology. It was found that the course was practical and enjoyable for participants, accelerated the shifting of the digital divide, connected multiple generations, and enhanced joy of lifelong learning. Opportunities for improvement were identified by both participants and facilitators, and best practices have begun to emerge for future multimedia digital art courses.

*Keywords*: multimedia digital art, older adults, arts in health, process evaluation
Evaluation of a Multimedia Digital Art Course for Older Adults

This process evaluation assessed a pilot, mobile device-based, multimedia digital art course for older adults at an independent living facility. Course curriculum involved residents using smartphones to engage in photography, photo editing, digital scrapbooking, videography, and augmented reality (AR). A logic model of the course is in Appendix A. The evaluation aimed to determine if this type of multimedia digital art course can efficiently advance the mission of the primary organization in a way that is suitable and enjoyable for participants and volunteers. It also proposed best practices for this population and setting. Overall, it assessed if a multimedia digital art course can be a positive addition to existing arts in health programming.

**Background**

This project was inspired by literature on the growing older adult population, creative aging, neuroscience, older adult adoption of technology, multimedia digital art, lifelong learning, and evaluation process. A systematic search was conducted in PubMed, Art & Architecture Source, AgeLine, and Google Scholar. A search strategy (Appendix B) was utilized.

Academic journal articles published between 2013 and 2018 were searched by title and filtered. Only English and full text articles were searched. For PubMed, only articles on humans over the age of sixty-five were included. Articles were excluded if they did not include participatory visual or multimedia digital art, focused on other contexts (e.g. creative art therapies), or focused on other populations (e.g. people with dementia). Results yielded seventeen articles from PubMed, one from Art & Architecture, and seven from AgeLine.

**Baby Boomers & Creative Aging**

In the United States, the rate of Baby Boomers turning sixty-five was estimated to start reaching 10,000 per day in 2013 (Gross, Danilova, Vandehey, & Diekhoff, 2013). This shift has
increased the importance of identifying activities affiliated with healthy cognitive aging (Fancourt & Steptoe, 2018). Arts programming for older adults has grown, making way for the field of creative aging (Ueno et al., 2015; National Center for Creative Aging, 2017). In a landmark study, Cohen et al. (2006) found that arts engagement lowered medication needs and loneliness of older adults, as well as improved moods, independence, and morale.

Arts engagement has been found to enhance health, quality of life, and overall well-being (Fancourt & Steptoe, 2018; Holt, 2018; Rajan & Rajan, 2017; Strout et al., 2016; Noice, Noice, & Kramer, 2014). It has been shown to increase positive aspects of well-being, while lowering anxiety and stress (Fancourt & Steptoe, 2018; Holt, 2018). Art-making has been considered intellectually challenging (Adams-Price, Nadorff, Morse, Davis, & Stearns, 2017). It has helped different generations connect (Brown, 2017). Using technology, making art, and taking educational classes have been noted as preventative factors against cognitive decline in older adults (Howard et al., 2016).

Rajan and Rajan (2017) found that arts engagement encourages “older adults to lead a healthier lifestyle” (p. 6). Older adults who made art and attended an arts-based event were noted as having better cognitive functioning, fewer physical limitations, lower hypertension, and slower health digression (Rajan & Rajan, 2017). Therefore, it has been recommended to increase art-making opportunities for older adults (Rajan & Rajan, 2017).

Phinney et al. (2014) found that participation in community art programming helped participants be active and social. They found that art-making required “hard work and effort” and allowed participants to feel they were “making a contribution” (Phinney et al., 2014, p. 341-342). Participants appreciated the challenge of learning and felt more confident (Phinney et al., 2014).
Neuroscience

Ueno et al. (2015) described how “creativity requires diverse high-level cognitive functions that are useful to integrate existing knowledge and to create something of value” (p. 524). Creating visual art has been shown to improve interaction between areas of the brain on a neural level, which is key to preventing age-related, chronic diseases (Bolwerk, Mack-Andrick, Lang, Dörfler, & Maihöfner, 2014). It has recently been observed impacting executive function and processing speed (Sharma & Babu, 2017).

Older Adults & Technology

Older adults have often hesitated to adopt newer technology due to poor eyesight, finances, and/or lack of interest or knowledge (Pheeraphuttharangkoon, Choudrie, Zamani, & Giaglis, 2014; Mohadisdudis & Ali, 2014; Berenguer et al., 2017). Pheeraphuttharangkoon et al. (2014) found that “there is a digital divide of smartphone adoption among young and old generations” (p. 11). However, this trend has been shifting (Berenguer et al., 2017). Older adults have been found to have a positive outlook on technology (Chopik, 2016). Smartphone usage has been linked to improved well-being and social connections for older adults, as well as decreased loneliness (Chopik, 2016). Taking a photograph was found to be the second most common reason for an older adult to use a smartphone (Pheeraphuttharangkoon et al., 2014). Older adults are more likely to adopt a smartphone if it seems to fit with his or her lifestyle, encouraged by family or friends, he or she understands how, the level of effort appears reasonable, it seems enjoyable, and he or she has the desire (Pheeraphuttharangkoon et al., 2014).

Multimedia Digital Art & Lifelong Learning

Within the arts in health context, visual art has not been limited to traditional mediums. It has also encompassed media art (National Organization for Arts in Health, 2017), referred to as
multimedia digital art in this evaluation. The term multimedia digital art has been selected to encompass both multimedia art and digital art. Multimedia art has been described as art that utilizes a variety of art forms (Santana, 2017). Digital art has been identified as art made with technology, which has also been called new media or computer art (Tribe & Jane, 2006).

Park et al. (2014) revealed learning new skills as key to healthy aging. Their study showed productive engagement was more beneficial to improving one’s cognition than receptive engagement. They described how productive engagement requires “active learning and sustained activation of working memory, long-term memory, and other executive processes,” whereas receptive engagement relies more on “passive observation, activation of existing knowledge, and familiar activities” (Park et al., 2014, p. 104). Their digital photography course was found to be more beneficial than quilt-making or crossword puzzles because of the unfamiliar, technical information involving computers and cameras (Park et al., 2014). Participants who completed a digital photography course had a significant increase in episodic memory (Park et al., 2014).

Technology has become increasingly integrated into arts in health, resulting in an emerging participatory, multimedia digital art trend (Hanna, Rollins, & Lewis, 2017). In 2014, approximately 13% of older adults reported creating some kind of multimedia digital art (Rajan & Rajan, 2017, p. 2). EngAGE, Inc. developed multigenerational art classes that paired older adults with adolescents to create claymation, movies, and video games (Wohlslagel, 2014). Photography has also been used for self-care (Davies, Knuiman, & Rosenberg, 2016).

**Facilitation of Older Adult Learning**

Cohen et al. (2006) identified mastery and social engagement as key components for older adult programming. Learning new skills and succeeding in overcoming challenges has helped older adults feel more confident (Phinney et al., 2014; Boyer, 2007; Wohlslagel, 2014).
Wohlslagel (2014) stated that creative aging programs should last sixty to ninety minutes, allow art creation, include a culminating event, provide achievable challenges, fulfill needs and expectations, be led by professional artists, include purposeful and meaningful projects, encourage lifelong learning, and utilize assessment methods. Additionally, relevance and practicality to participants’ lives and interests have been noted as important for adult learning (Boyer, 2007; Wohlslagel, 2014).

**Evaluation Process**

Piloting and evaluating a program were noted as key steps that help assess appropriateness of design, efficiency, and trajectory of achieving aims (Fancourt, 2017). Creswell (2014) described convergent parallel and exploratory sequential as two mixed methods designs. Elo and Kyngäs (2008) described inductive content analysis to be applicable when there is no clear knowledge base to which one can compare the data. Creswell (2014) proposed a step-by-step method to quantitative data analysis.

**Methods**

A process evaluation was conducted using a mixed methods approach, a pragmatic philosophical worldview, and a convergent parallel mixed methods design. The primary aim was to identify strengths and weaknesses of the course as an addition to existing programming. It assessed if the pilot course was suitable and enjoyable for participants and volunteers, run efficiently, and capable of advancing the organization’s mission. Additionally, it proposed best practices for future, multimedia digital art courses for older adults.

**Program Details**

The pilot course involved five, one-hour-long, weekly workshops that were facilitated in-person at an older adult independent living facility. The course was a collaborative effort
between two arts in health organizations. Both the primary course facilitator and the volunteer were professional graphic designers. The curriculum included five projects that were made with free applications (apps) on participants’ smartphones. A brief needs assessment was conducted during the first class, which led to changing the project for the last class. Printed handouts were provided to participants for each project. Projects included digital photography, photo editing (Photoshop Express), a digital scrapbook page (Adobe Spark Post), video editing (Quik), and an AR print (Lifeprint).

Once the course concluded, a culminating event allowed participants to share art created during or inspired by the course. Artwork was printed and displayed. Each participant chose to display their AR print (from the last class) and a photo collage (created outside class).

Population

Participants. Pilot course participants included three older adult residents at an independent living facility, all over the age of sixty-five. Participation was voluntary. Residents of the facility included both men and women, but only women chose to participate.

Volunteer. The assistant facilitator was a volunteer with the primary arts in health organization involved. She was a graphic designer who has been trained to work with various populations in healthcare and community settings. She assisted with three of five classes.

Data Collection

Evaluation data was collected through surveys and observational notes. Two types of paper surveys were administered to participants. Participants completed a project survey after each class (Appendix C) and a course survey upon course completion (Appendix D). A box was available for these completed surveys, and the facilitator stepped out of the room during completion. A survey was administered to the volunteer upon course completion, using the
Qualtrics interface (Appendix E). Qualitative and quantitative questions were included in all evaluation surveys.

Weekly observations were made by the primary instructor regarding date, participant quantity, facilitator quantity, project, successes, challenges, questions, concerns, and additional relevant information. Data was digitized and stored on a password-protected computer, along with the observational notes.

**Analysis Methods**

Inductive content analysis was used to analyze qualitative data from surveys and observational notes. This evaluation followed the inductive content analysis process described by Elo and Kyngäs (2008). Processes described by Saldaña (2016) were followed for coding, categorization, and theme development. Open coding included conventional coding, memo writing, clustering, and developing a codebook (Appendix F). Categorization included focused coding, before moving onto magnitude coding and developing themes by establishing relationships between categories and subcategories. Quantitative analysis strategies discussed by Creswell (2014) were used, which included reporting participant quantity, checking for response bias, descriptive analysis, and interpreting the results.

**Results**

**Qualitative Data**

The first cycle of coding yielded seventy-four codes, and the second yielded eleven more (Appendix F). A word cloud was generated with these codes (Figure 1). Codes were developed into categories and subcategories. These categories identified pilot course successes and improvement opportunities (Appendix G), as well as proposed best practices for future multimedia digital art for older adults (Appendix H). The pilot course was found to be practical for participants, accelerate the shift of the digital divide, connect multiple generations, and
enhance enjoyment of lifelong learning. Opportunities for course improvement were identified by participants and facilitators.

Figure 1. Word Cloud. This graphic shows codes extracted from qualitative data, with more common codes appearing larger.

Practical for participants. Making the course practical for participants was observed as a key component of the course. Projects relevant to participants’ lives and interests helped participants accomplish personal goals. Since all participants had previously taken a scrapbooking course, the facilitator observed the digital scrapbooking project to be very compatible with the participants’ lives. Participants also discussed using their new skills outside class, often to make a gift for someone.
**Shifting the digital divide.** Participants were found to have existing familiarity with technology, but lacked knowledge of specifics. During the first class, one participant said she wanted to print a video onto a page and another stated how she saw that in a newspaper. However, neither knew the term they were describing (AR).

Presenting information in a clear and understandable way, as well as the ability to address individual questions, appeared to enhance participants’ confidence using technology. One participant expressed this after photo editing:

> I learned how to use Photoshop Express on my phone. I have [Photoshop] for my computer and never tried it ’cause it looks so complicated. NO MORE! (personal communication, January 25, 2018).

Additionally, projects like AR helped participants feel they were on the cutting edge of technology.

**Connecting multiple generations.** Participants appeared to believe that members of their family are more technologically advanced than they are. However, this course appeared to alter this: “My entire family is so technologically advanced and it’s exciting to feel like I’m on the cutting edge when I’m a [participant’s age] grandmother!” (participant, personal communication, February 15, 2018). Participants often shared their completed projects with family immediately, as well as mentioned projects as a topic of conversation with family outside of class.

**Enhancing enjoyment of lifelong learning.** Participants enjoyed the lifelong learning process and the intellectual challenge this course brought. Two of three participants wrote a note next to a survey question asking about course difficulty level. Both participants selected “very hard” and wrote a message clarifying that “very hard” meant “very good” (personal communication, February 15, 2018). Participants were proud of their projects and eager to share
their new knowledge with others. “I love learning something new and sharing such cool technology with my family,” one participant said (personal communication, February 15, 2018).

Participants appeared to enjoy discovering app features through exploration. They also expressed desire to continue mastering skills even further. “I’d love to have this and other exciting new tech classes…” (participant, personal communication, February 15, 2018).

Suggestions from participants & facilitators. Several similar suggestions for improvement were made by both participants and facilitators. Both acknowledged the importance of reducing sound distraction, lowering the pressure of time constraints, and simplifying projects as much as possible. The sound elements of video and AR were observed and noted to be distracting for participants. “The last two classes were loud and confusing to me,” said one participant (personal communication, February 15, 2018). Participants were also observed immediately silencing their phones.

Participants and facilitators felt class time was constrained. One participant expressed this during a project survey: “A one hour class is not enough. We need two hours.” (personal communication, January 18, 2018). Video was noted and observed as most difficult for participants, potentially due to complexity of the project or the lack of an additional facilitator. A participant suggested simplification for the video project: “… have us all choose a certain [number] of photos and work through the program effect by effect…” (personal communication, February 8, 2018).

Suggestions from facilitators. Observations were made by facilitators that were not specifically mentioned by participants. They believed that practicing and prepping more outside of class would lead to better use of class time and enhanced learning and enjoyment. When asked improvement suggestions, the volunteer suggested to “… have a guide supplied…before the
course...and give instructions on how to set up their devices...a large portion of the class was spent on bringing everyone up to speed...” (personal communication, February 22, 2018).

Offering a variety of courses at different skill levels would be beneficial, according to the primary facilitator. Additionally, it was found important that participants have realistic expectations of course projects and app limitations. It was noted that further precautions could be taken to reduce technical difficulty, particularly regarding variance between Android and iOS devices. Having enough knowledgeable facilitators available to answer individual questions appeared to correlate to participants’ enjoyment of learning. One participant hinted at this, as well, by stating “…having [volunteer’s name] to help us individually also helped when there are so many new things to learn” (participant communication, February 15, 2018).

**Quantitative Data**

The same three participants were present for every class, except for the second, when one participant was out sick. A fourth participant attended the last class, but chose to not fill out the survey. A volunteer was present as a secondary facilitator for the second, third, and fifth classes. The first and fourth classes were led solely by the primary facilitator.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Surveys</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Facilitators</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

The primary facilitator verbally discussed the class with the participant who abstained. She did not fill out the survey purely because she was not present for any other classes. Her impression of the last class appeared similar to others. Therefore, it is anticipated that her survey responses would not have dramatically affected results.
Statistical measures were derived from quantitative survey questions. Participant enjoyment of the course was a measure, from participant and volunteer perspectives. Participant enjoyment of each project, quantity of participants who selected a project as her favorite, participant interest in future courses, volunteer’s perceived contribution, and perceived level of course difficulty were additional measures. Quantities of participants who felt they learned new skills, and/or plan to use these new skills, were the last measures.

Means, modes, standard deviations, highs, lows, and ranges were calculated for each measure. The standard deviation equation accounting for bias was utilized. If the quantitative response was not a number, a number was assigned to represent an applicable value. A table with detailed results from this analysis can be seen in Appendix I.

Quantitative data indicates that participants unanimously enjoyed the course and most of the projects. A graph of participants’ enjoyment of each project can be seen in Figure 2. Although all participants said they enjoyed digital photography in the first project survey (Figure 2), no one noted it as their favorite (Figure 3).
Figure 2. Participants’ Level of Enjoyment by Project. This graph shows if participants enjoyed (3), somewhat enjoyed (2), or did not enjoy each project (1). Zero means the participant did not complete the survey that week.

Figure 3. Participants’ Favorite Projects. This graph shows participants’ favorite projects.

AR was everyone’s favorite, followed by digital scrapbooking and video, then photo editing, then digital photography. The volunteer felt she succeeded in helping participants complete projects. All participants felt they learned new skills, and most planned to use them outside class. Participants’ perceptions of difficulty level varied. Two noted the course as very hard, while the third said it was easy. All participants are interested in future, similar courses.

Discussion

Comparison of qualitative and quantitative data yielded similar results in regards to suitability and enjoyment, course efficiency, alignment with the organization’s mission, and proposed best practices. Overall, the pilot course appeared to have been designed in a way that was suitable and enjoyable for both participants and volunteers. It appeared to be run efficiently, but opportunities for improvement have been identified. The course aligns with the
organization’s mission, and best practices have been proposed in Appendix H.

There was only one source of contradictory information between qualitative and quantitative data. In one course survey, a participant noted that she expected to learn something different and did not enjoy what was taught. However, in every weekly project survey, she stated that she did enjoy the project. The only time she hinted at not enjoying the project was when she said she “somewhat” enjoyed the video project (rather than the “yes” all other projects received).

The video project appeared most challenging for participants and too complicated with existing conditions. Three factors came into play. First, the volunteer was not present that day, which left only one facilitator available to answer questions. Second, it included sound elements, which were found to be distracting. Last, the participant that practiced the app prior to class seemed to enjoy it more than the others.

The structure of this course appeared to work as an introductory course, focusing on the variety of possibilities. However, it was not ideal for mastery, which was identified as key for older adult learning (Cohen et al., 2006). A desire for mastery was confirmed in this course.

Additional links to the literature emerged. Adams-Price et al. (2017) discussed the role of “recognition or praise from others” within creative engagement. This involves a “sense that other people recognize and admire one’s creative products and the skill involved in creating them” (Adams-Price et al., 2017, p. 14). The importance of being able to share one’s work with others appeared particularly relevant in this course, as multiple participants immediately sent projects to their children upon completion.

Factors identified by Pheeraphuttharangkoon et al. (2014) that encourage smartphone usage among older adults aligned with results from this evaluation. Using a smartphone was perceived to fit into their lifestyles, and their families seemed to play important roles.
Participants appeared to believe in their abilities to tackle technological challenges, as long as the facilitator was available to answer questions. Participants having the intention to learn new apps was vital to their enjoyment of the course.

Intellectual challenge was another key link to literature. Phinney et al. (2014) described how participants in their study appreciated the challenge that came with learning a new skill and felt their confidence grew by overcoming it. Park et al. (2014) discussed how a digital photography course encouraged productive engagement by providing intellectual challenge for participants with unfamiliar, technological elements. This pilot course aligned with this literature in that participants expressed for its intellectually challenging aspects. Learning new technology and feeling like they were on the cutting edge was very exciting for participants.

Overall, categories developed in this evaluation generally aligned with existing literature. Relevance to participants’ lives and interests appeared important, as discussed by Boyer (2007) and Wohlslagel (2014). The digital divide appeared to be shifting, as proposed by Berenguer et al. (2017). This course showed evidence of connecting multiple generations, but differently than what Brown (2017) described. Ensuring challenges were achievable, expectations aligned, and workshops were led by professional artists (as suggested by Wohlslagel, 2014) appeared to enhance the lifelong learning experience.

**Limitations & Recommendations**

This study only had three participants and one volunteer, all of whom were female. All participants considered themselves “straight A students” and showed familiarity with technology at the beginning of class. Results do not account for people who may not already own or use a smartphone. A wider sample of participants would be ideal, in regards to gender, age, skill level with technology, and location.
Data collection did not involve a pre-test. The course survey revealed that participants felt empowered to take on new challenges at the end of the course. However, it did not ask feelings about this, prior to beginning the course. A pre-test asking the same question at the beginning would provide a better comparison.

One individual served as the primary investigator, course facilitator, and observational note taker. This was the first evaluation conducted by this evaluator. Having an evaluator outside the organization and less involved in the facilitation of the course itself may strengthen results.

This study may have benefitted more from an exploratory mixed methods design. With this design, the qualitative data would have been collected first, interpreted, and a quantitative instrument would have been created and administered to participants (Creswell, 2014). Since the evaluation was not centralized around results of previous studies and the qualitative data yielded a bounty of information, this design could have been beneficial in clarifying and quantifying the interpreted qualitative data.

Conclusion

This pilot, multimedia digital art course appeared to be a unique opportunity for older adults to create art, while also acquiring and enhancing technology-based skills. The evaluation found the course aligned with the mission of the primary arts in health organization, as it was found to be suitable and enjoyable for both participants and volunteers. The course was practical for participants, accelerated the shift in the digital divide, connected multiple generations, and enhanced enjoyment of lifelong learning. Suggestions were made by both facilitators and participants that will be taken into account for future courses. A list of proposed best practices (Appendix H) has emerged for future multimedia digital art courses with older adults, both within the primary organization involved, as well as similar programs elsewhere.
References


Davies, C., Knuiman, M., & Rosenberg, M. (2016). The art of being mentally healthy: A study to quantify the relationship between recreational arts engagement and mental well-being in


User Science and Engineering (i-USEr).


EVALUATION OF A MULTIMEDIA DIGITAL ART COURSE


## Logic Model

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short Term Outcomes</th>
<th>Long Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts in medicine graduate student (with expertise in multimedia digital art and graphic design)</td>
<td>Graduate student leads multimedia digital art course with assistance from volunteer artist(s) and guidance from established arts in health organizations. Classes are in-person, hands on, and presented in a way that is understandable to target audience.</td>
<td>A new, in-person, multi-week, multimedia digital art course for residents (a collaborative effort of the two arts in health organizations)</td>
<td>Residents can attend a wider variety of programs, one that will enhance their knowledge of multimedia digital art and mobile app usage</td>
<td>Best practices for a course like this are established and similar courses are offered in the future (other locations, similar topics)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Handouts for each project</td>
<td>Participants can practice on their own time outside of class and follow along better in class</td>
<td>Participants have a better understanding of course content and are able to enhance their skills further</td>
</tr>
<tr>
<td>Supervision and collaboration (secondary arts in health organization)</td>
<td>Secondary arts in health organization provides the facility, participants, and guidance to ensure proper protocols and structure are followed</td>
<td>The course upholds the values and protocols already established by the secondary arts in health organization</td>
<td>Participants enjoy learning new skills and making art</td>
<td>More collaborative efforts between the two organizations and other multimedia digital art courses for older adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A culminating event to show participant’s work</td>
<td>Participants are able to share work with others (in-person)</td>
<td>Others may be inspired to take a similar course</td>
</tr>
<tr>
<td>Supervision and collaboration (primary arts in health organization)</td>
<td>Primary arts in health organization provides volunteer artists who are trained to work with sensitive populations and provides guidance as needed</td>
<td>The course upholds the values and protocols already established by the primary arts in health organization</td>
<td>Staff and residents are assured that the classes are being taught by people who are both knowledgeable in the field and trained to work with populations that may be more sensitive than the average person</td>
<td>More collaborative efforts between the two organizations and other multimedia digital art courses for older adults</td>
</tr>
<tr>
<td>Volunteers from the primary arts in health organization (photographers, graphic designers, multimedia artists, etc.)</td>
<td>Volunteer artists provide expertise unique to his or her particular discipline</td>
<td>Course content delivered by experienced professionals</td>
<td>Volunteers contribute skills and expertise in a meaningful way</td>
<td>Volunteer artists feel they are involved and contributing to their community in a meaningful way</td>
</tr>
<tr>
<td>Older adult participants at a senior independent living facility that focuses on engaging in the arts and lifelong learning</td>
<td>Residents attend and participate in the multimedia digital art course</td>
<td>Participants who are interested in learning new skills</td>
<td>Participants have an intention to learn new skills</td>
<td>Participants continue to have a desire to learn new skills and advanced the skills established in this course, promoting lifelong learning and decreasing the “digital divide”</td>
</tr>
<tr>
<td>Mobile devices (capable of downloading applicable apps)</td>
<td>Mobile devices are made available to participants if they do not plan to bring their own and back-ups are available, in case of any technical difficulties</td>
<td>Mobile devices for each participant</td>
<td>Participants are able to complete the projects</td>
<td>Participants feel more comfortable to try doing similar projects in the future</td>
</tr>
</tbody>
</table>
Appendix B

Literature Search Strategy

(“older adult” OR “older adults” OR “old people” OR “old person” OR “older people” OR “older person” OR seniors OR “senior people” OR “senior person” OR “senior citizen” OR “senior citizens” OR elderly OR “aging adult” OR “aging adults” OR “healthy aging” OR “independent aging” OR “creative aging” OR “arts and aging” OR “silver surfer” OR “silver surfers” OR “digital immigrants” OR “digital immigrant”) AND (“multimedia digital art” OR “multimedia art” OR “digital art” OR “media art” OR “new media art” OR “electronic art” OR art OR arts OR “visual art” OR “visual arts” OR artistic OR photo* OR “digital photography” OR photography OR animation* OR “stop motion” OR “film making” OR “video making” OR “making videos” OR videography OR “video editing” OR “film” OR “motion picture” OR “graphic design” OR claymation OR “stop motion” OR “game design” OR “digital poster” OR “digital posters” OR “digital scrapbook” OR “digital scrapbooks” OR “digital scrapbook page” OR hyperphoto OR “AR” OR “augmented reality” OR “digital postcard” OR “digital postcards” OR “mobile app” OR “mobile apps” OR apps OR “smartphone” OR “smartphones” OR “tablets” OR “iPad” OR “iPads” OR “iPhone” OR “iPhones” OR creativ* OR “lifeprint” OR “adobe spark post” OR “adobe” OR photoshop OR “photoshop express” OR “adobe spark” OR quik OR “adobe spark video” OR iMovie OR “arts in health”) AND (efficacy OR effective* OR evaluat* OR pilot OR “best practice” OR “best practices” OR “content analysis” OR “content analyses” OR intervention* OR treatment* OR program* OR strateg* OR approach* OR “case study” OR “case studies” OR review OR survey* OR questionnaire* OR “process-evaluation” OR “process evaluation” OR “mixed methods” OR “convergent parallel mixed methods”)
Appendix C

Project Survey (Participants): Administered on Paper, In-Person

This survey is anonymous and optional. Please do NOT write your name on this, and please be honest. We need to hear of any concerns you might have about the program. Results will be shared with the University of Florida, [Name of Arts in Health Organization #1], and [Name of Arts in Health Organization #1]. A report that excludes all identifiable information will be published to the University of Florida Library and searchable online. The survey will take just a few minutes to complete. You can skip any question you don't want to answer, and can withdraw before completing it if you want to. We will provide you with contact information if you have any questions about our study. Thank you!

- Did you enjoy this project?
  - Yes
  - Somewhat
  - No

- Why or why not?
  __________________________________________________________
  __________________________________________________________
Appendix D

Course Survey (Participants): Administered on Paper, In-Person

This survey is anonymous and optional. Please do NOT write your name on this, and please be honest. We need to hear of any concerns you might have about the program. Results will be shared with the University of Florida, [Name of Arts in Health Organization #1], and [Name of Arts in Health Organization #1]. A report that excludes all identifiable information will be published to the University of Florida Library and searchable online. The survey will take just a few minutes to complete. You can skip any question you don't want to answer, and can withdraw before completing it if you want to. We will provide you with contact information if you have any questions about our study. Thank you!

- How much did you enjoy this course?
  - I loved it
  - I liked it
  - I thought it was OK
  - I disliked it
  - I hated it

- How difficult do you feel this course was?
  - Very Easy
  - Easy
  - Average
  - Hard
  - Very Hard

- Do you feel like you learned something new?
  - Yes
  - No

- Would you be interested in taking another class similar to this one in the future?
  - Yes
  - No

- What parts of the course do you think worked well?
  

- What parts of the course do you think need improvement?
• What was your favorite project?
  o Taking Photos
  o Photo Editing
  o Customized Postcard/Digital Scrapbook Page
  o Slideshow/Video
  o Augmented Reality

• Why was this your favorite project?

• How do you feel about trying other things that might be new to you in the future?

• Do you plan to use any of the apps techniques you learned here in the future?
  a. Yes
  b. No
  c. Maybe

• Is there anything else you would like to say?

______________________________________________________________________
______________________________________________________________________
Appendix E

Volunteer Survey: Administered Online, Using Qualtrics

This survey is anonymous and optional. Please do NOT write your name on this, and please be honest. We need to hear of any concerns you might have about the program. Results will be shared with the University of Florida, [Name of Arts in Health Organization #1], and [Name of Arts in Health Organization #1]. A report that excludes all identifiable information will be published to the University of Florida Library and searchable online. The survey will take just a few minutes to complete. You can skip any question you don't want to answer, and can withdraw before completing it if you want to. We will provide you with contact information if you have any questions about our study. Thank you!

1. What aspects of this course do you think went well?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

2. What aspects of this course could be improved?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

3. Do you think the participants generally enjoyed the project(s)?
   1. Yes
   2. No

4. Do you feel that you were able to help participants complete the projects?
   1. Yes
   2. No

5. Is there anything else you would like to say?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
Appendix F

Codebook

This codebook includes data from volunteer course surveys, participant surveys, observational notes, and memos.

1st Cycle

Codes below emerged during conventional coding.

1. Accessibility

It’s implied that a participant has regular access to relevant tools outside of class (i.e. smartphones).

- **Observation:** “All 3 participants brought their own smartphone to the class”
- **Participant Feedback:** “She showed me many things on my android camera phone that I didn’t know about.” The key word here is my, which implies that she owns a phone and has regular access to it.

2. Android vs. iOS

Challenges for handling iOS devices versus Android devices is noted.

- **Observational Note:** “Adobe Spark apps are not available on Android devices”

3. Anticipation

Participant appeared to look forward to a project from early on in the course.

- **Participant Feedback:** “Augmented Reality was discussed the first week. I was excited about learning it.”
- **Observation:** “Participants seemed genuinely interested in multimedia art and the projects we discussed.”

4. AR = Favorite Project

Participants appeared to enjoy AR most.

- **Participant Feedback:** “Augmented reality was my favorite project”

5. Bring On Future Challenges!

Participants feel empowered and ready to tackle future challenges.

- **Participant Feedback:** “Bring them on!” (In response to asking how they feel about learning new things in the future)
- **Participant Feedback:** “I’m looking forward to the next class!!!”

6. Clearly Stated Info

Information was delivered in a way that was understandable to participants.

- **Participant Feedback:** “Clearly stated information” (Digital Photography)

7. Cutting Edge

Participants appear excited to be on the “cutting edge” of technology.

- **Participant Feedback:** “…it’s exciting to feel like I’m on the cutting edge when I’m a [participant’s age] yr old grandmother”
- **Participant Feedback:** “I’d love to have this and other exciting new tech classes.”
8. Discovery Through Exploration
New techniques were discovered by participants through experimentation and exploration of the app itself.

- **Observation:** “Allowing the participants to explore the app themselves” appeared to work well, until they had a specific task they were trying to accomplish and couldn’t figure out on their own.
- **Participant Feedback:** “Fun to change photos – great to add text – something I really need for a project I’m working on.” These were techniques she discovered just by tapping around on her own and asking the facilitators questions as she went, rather than following along step-by-step.

9. Displayed Art Done Outside Class
Art selected to display for others to view in the culminating event was created outside of class.

- **Observation:** “Art they selected to print and show at the culminating event were more so ones that were inspired by the course and created on their own time.”

10. Eager to Learn
Participants appear eager to learn. The participant may have expressed excitement, practiced the app in advance, or immediately gotten started without waiting for facilitator instruction.

- **Observation:** Participants “embraced the technology and were eager to learn everything I know and all the apps that exist out there”
- **Participant Feedback:** “I’d love to have this and other exciting new tech classes.”

11. Efficiency
The course appears to be run efficiently, as noted by a participant, facilitator, or during memo-writing.

- **Participant Feedback:** Technical “glitches were handled well’
- **Participant Feedback:** “Informative, clearly stated information”

12. Enjoyment of Course/Project
Participant appears to have enjoyed the course or a particular project.

- **Participant Feedback:** “Excited to go on with the next four classes.”
- **Participant Feedback:** “I made a scrapbook page without having to physically cut & paste!”

13. Everyday Lives
Course skills appear relevant and applicable to a participant’s everyday life.

- **Observation:** “This project seemed very compatible with the participants’ lives because it is like making a virtual scrapbook page (and all participants previously took a scrapbook course).”
- **Participant Feedback:** “I made a scrapbook page without having to physically cut & paste!” All participants were had a common hobby, scrapbooking.

14. Expectation Preparation
Prepping participant expectations is observable as ideal. This includes examples of when participants’ expectations could have been better prepped.

- **Observation:** “Warning them a week ahead of time that the app and printer might be finicky because it is new technology” worked well. Although we encountered random, unexpected technical difficulties, participants were not discouraged or frustrated because I had warned them it may happen the week prior.
- **Participant Feedback:** “I didn’t really learn about digital scrapbooking...” This participant expected to learn more about digital scrapbooking, which was not what the class was about.
15. Expected Something Different
Participant expected to learn something different.

- **Participant Feedback**: “I didn’t really learn about digital scrapbooking...” This participant expected to learn more about digital scrapbooking, which was not what the class was about.

16. Exploration vs. Step-by-step Instruction
This code attempts to identify which projects exploration seemed more appropriate than step-by-step instruction and vice versa.

- **Observation**: “They think they may have preferred following along as a step by step process together” (Video)
- **Participant Feedback**: “I learned how to use Photoshop Express on my phone. I have PS for my computer and never tried it ‘cause it looks so complicated. NO MORE!” A new confidence was instilled in this participant after a class that had more of an exploratory approach (Photo Editing).

17. Family Members = Technologically Advanced
Participant believes their family members are “technologically advanced”.

- **Participant Feedback**: “My entire family is so technologically advanced and it’s exciting to feel like I’m on the cutting edge when I’m a [participant’s age] yr old grandmother”
- **Observation**: “One of them has a child that is a graphic designer and she loves being able to share what she learns in this class”

18. Gratitude
Participants expressed gratitude for the course.

- **Participant Feedback**: “Thanks so much!”

19. Handouts
Printed handouts appeared beneficial.

- **Memo**: Handouts allowed participants to follow along in class and practice on their own outside of class.
- **Participant Feedback**: “I’ll practice more this week.” The handouts are beneficial here because the participant is able to utilize them when she practices at home.

20. Individual Instruction
It’s observed that having one facilitator for every one to two people is more beneficial than one to three.

- **Memo**: 1:1 or 1:2 instruction = more ideal
- **Participant Feedback**: “Having [Name of 2nd Volunteer Facilitator] to help us individually also helped when there are so many new things to learn”

21. Informative
Participant appears to perceive the class or course as informative.

- **Participant Feedback**: “Informative”
- **Participant Feedback**: “[2nd Facilitator’s Name] knows everything!”

22. Intellectual Challenge
EVALUATION OF A MULTIMEDIA DIGITAL ART COURSE

Course was perceived, by a participant or facilitator, as a positive intellectual challenge for participants. It was an appropriate level (rather than too challenging) for the participant.

- **Volunteer Feedback:** “Seniors need classes like these to stimulate their minds”
- **Participant Feedback:** “I learned how to use Photoshop Express on my phone. I have PS for my computer and never tried it because it looks so complicated. NO MORE!”

**23. Interests & Hobbies**

Course projects were noted to be relevant to participants’ personal interests & hobbies.

- **Observation:** The digital scrapbook project was “very compatible with the participants’ lives because it is like making a virtual scrapbook page (all participants previously took a scrapbook course)”
- **Participant Feedback:** “…something I really needed for a project I am working on…”

**24. Interest in Future Classes**

There is an interest in future multimedia digital art classes or courses. This includes anticipation for the next class.

- **Participant Feedback:** “I’d love to have this and other exciting new tech classes.”
- **Participant Feedback:** “I’m looking forward to the next class!!!” This was feedback on the course as a whole.

**25. Interest in Technology**

Participants appeared interested in technology.

- **Observation:** “Participants are eager to learn new ways to use their smartphone and about the new technologies they can use to make art” (Video)
- **Participant Feedback:** “My entire family is so technologically advanced and it’s exciting to feel like I’m on the cutting edge when I’m a [participant’s age] yr old grandmother.”

**26. Intergenerational Social Connection**

Participant discusses course skills as a conversation topic between multiple generations (i.e. children, grandchildren).

- **Observation:** “One of them has a child that is a graphic designer and she loves being able to share what she learns in this class.”

**27. Introduce Others to New Technology**

Participant enjoyed introducing others to a technology they learned about in class.

- **Participant Feedback:** “I love…sharing such cool technology with my family.”
- **Participant Feedback:** “It was fun to send the video and posters to my daughters.”

**28. Joy of Learning Something New**

Participants appear to have enjoyed learning something new.

- **Participant Feedback:** “I loved learning something new…”
- **Participant Feedback:** “She showed me many things on my android camera phone that I didn’t know about. Excited to go on with the next four classes.”

**29. Knowledgeable Facilitator(s)**

People facilitating the course appear knowledgeable about the technology being used.

- **Participant Feedback:** “Very knowledgeable teacher.”
• Observation: “Random tips/tricks that I find helpful and use myself (grid view, tap to focus/adjust lighting)” were considered something that worked well. This implies that participants found the instructor knowledgeable on the topic being taught.

30. Last Classes = More Complex
The last two classes were considered more complex (Video & AR).
• Participant Feedback: “The last two classes were loud and confusing for me...”
• Participant Feedback: “I’d like to have two classes for each of the last two sessions.”

31. Learned New Skills
Participants successfully learned new skills.
• Participant Feedback: “I learned a lot!” (Video)
• Participant Feedback: “My entire family is so technologically advanced and it’s exciting to feel like I’m on the cutting edge when I’m a [participant’s age] yr old grandmother.”

32. Many Questions
Participants had many technical questions.
• Observation: “I often was just the person to ask technical questions as they figured out things on their own.”
• Participant Feedback: “It was too confusing for me today.” It is implied that the participant had many, potentially unanswered, questions.

33. Mastery
Participant expressed desire for mastering skills (directly or implied).
• Observation: Participants “wanted to master the skills and actually learn them, but didn’t have time to” during class.
• Observation: Participants were “open to having homework and giving them something to take home and read”

34. Meaningful
The course is perceived meaningful by a participant or facilitator. This implies that it was more than just informative and that the class potentially had more of a positive, lasting impact on the participant or facilitator.
• Volunteer Feedback: “Seniors need classes like these to stimulate their minds”
• Participant Feedback: “My entire family is so technologically advanced and it’s exciting to feel like I’m on the cutting edge when I’m a [participant’s age] yr old grandmother.”

35. Missing 2nd Facilitator
The absence of a second, knowledgeable facilitator negatively impacted participants.
• Observation: “Lacking a second person who is knowledgeable on the app and can yield questions” was noted as something that didn’t work well that day (Video).
• Participant Feedback: “Quik – Need instruction manual”; There was only one knowledgeable facilitator that day, which may have impacted how complex the project appeared to participants.

36. Multiple Knowledgeable Facilitators
It’s observed that having multiple, knowledgeable facilitators is more beneficial than having just one.
37. New Take on Familiar
Project was a new take on something already familiar to the participants. For example, these participants had a common hobby of traditional scrapbooking, so creating a digital scrapbook page was a new take on this.

- **Participant Feedback:** “I made a scrapbook page without having to physically cut & paste!”
- **Participant Feedback:** “I didn’t really learn about digital scrapbooking…” She appears to have been interested in the course due to this connection to an existing hobby.

38. Opportunity to Share
Participants having the opportunity to share their project and/or knowledge was perceived as beneficial.

- **Observation:** ‘Participants enjoyed showing off their newly acquired skills as they learned them; Sharing with each other as we were going along: "Look at my green cat!"; allowed them to share what they learned and their art’ was noted as something that worked well.
- **Participant Feedback:** “It was fun to send the video and posters to my daughters.”

39. Outside Practice
Participant practiced course-related skills outside of class.

- **Observation:** “One of the participants downloaded the app ahead of time and explored it herself on her own time…”

40. Outside Use Plan
The participant expresses a plan to use a skill she learned in class outside of class.

- **Participant Feedback:** “I’ll practice more this week”
- **Participant Feedback:** “Fun to change photos – great to add text – something I really need for a project I’m working on.”

41. Page Numbers
Having page numbers on the printed handouts was beneficial.

- **Observation:** “Having page numbers: Participants asked, “What page are you on?” and I was able to respond with a number’ was noted as something that worked well.

42. Participant-Suggested Project
A participant suggests a specific project, which was later integrated into the course.

- **Observation:** “…They all had specific projects in mind and goals they want to accomplish going into the class (i.e. digital scrapbook, book with text and photos, AR)”

43. Participant Goals
Participant appears to have had a specific goal for a project they are/were working on.

- **Observation:** “…They all had specific projects in mind and goals they want to accomplish going into the class (i.e. digital scrapbook, book with text and photos, AR)”
- **Participant Feedback:** She stated that a technique she learned in class today is “…something I really needed for a project I am working on…”
44. Periodic Check In
It was perceived that periodically checking in on a participant exploring the app was beneficial.

- Observation: “‘How are you doing over here?’ Periodically checking in on someone exploring the app’ was noted as something that worked well.

45. Personal Touch
Project was capable of having a personalized touch, such as incorporation of a participant’s photos.

- Memo: Installing apps on their phone gave them easy access to their own photos, which may be more personally meaningful than random ones that could be provided.
- Observation: “Participants brought their own phone (that they use regularly and are familiar with).” This also implies that they have access to their own photos.

46. Positive Facilitator Quality
A positive quality of the facilitator(s) is identified by a participant.

- Participant Feedback: “[1st Facilitator Name] was so gracious and enthusiastic”

47. Project as Gift
Participants discussed using their new skills to make a gift for someone.

- Memo: After the video class, a participant stated, “I’m excited to have made a real music video! This is a surprise for my daughter who went with me and appears in the video along with me.”
- Observation: “Participants often wanted to share what they created with their children or even create something as a surprise for one of their children.”

48. Project Pride
A participant appeared proud of a specific project or task they completed.

- Participant Feedback: “I was able to create a great scrapbook page.”
- Observation: “They appear to really enjoy the idea of being on the cutting edge of technology and being able to show off what they learned to their kids (and impress their kids).”

49. Sharing with Family
Participants enjoyed sharing projects with family.

- Participant Feedback: “It was fun to send the video and posters to my daughters”
- Observation: “Participants were eager to show off their projects; one of them sending it to her daughter immediately”

50. Simplified Handouts Encouraged Exploration
Handouts that were simpler and explanatory of the app features available (less step-by-step) encouraged exploration and discovery.

- Observation: “Simplified handouts (shorter, more focused on the tools available within the app; left room for exploration rather than exact direction)”

51. Simplified Instruction – Success
This includes ways in which the pilot course successfully simplified instruction.

- Observation: “Printing just a video rather than a photo with a video connected to it” (AR)
• **Participant Feedback:** “I learned how to use Photoshop Express on my phone. I have PS for my computer and never tried it ‘cause it looks so complicated. NO MORE!” The class in which this participant stated that was one were the instruction was more simplified and exploratory.

52. **Simplified Instruction – Opportunity**
This includes ways in which future courses may want to simplify instruction further.

• **Participant Feedback:** “There was so much to learn it might have helped to have us all choose a certain # of photos and work through the program effect by effect so we can do it all at the same time. It was too confusing today to me.”

• **Participant Feedback:** “Quik – Need instruction manual”; Quik is the app that was used that day; this statement implies that the project appeared too complex and could have been simplified.

53. **Sought Skill**
Course taught specific skills that participants were seeking.

• **Participant Feedback:** “Fun to change photos – great to add text – something I really need for a project I’m working on.”

54. **Sound Distracting**
Participants found background sounds distracting.

• **Observation:** “Sound/noise from the videos this class and last class seemed a bit distracting and unenjoyable for participants...they often tried to immediately silence it. Maybe we should offer headphones or silence and focus on sound separately, later?”

• **Participant Feedback:** “It was too confusing today to me.” This was a response from a participant in regards to a class in which sound was introduced into the class for the first time.

55. **Specific Vision + App Limitations = Frustration**
Participants showed signs of frustration when they had something specific in mind and couldn’t quite do it in the app.

• **Participant Feedback:** “I have ideas I want to do, but can’t do it on this program we practiced on today.”

• **Observation:** “Participants expected to be able to customize their project a bit more than the app was capable of, but still enjoyed discovering new features and techniques”

56. **Suggestion – Avoid Technical Difficulty (When Possible)**
A way to avoid technical difficulties in the future is suggested.

• **Memo:** If Wi-Fi is required, test it out in the setting you will be in prior to the course starting; this was a memo in response to Wi-Fi issues on Day 1, 2, and 3.

• **Memo:** Test out all projects on someone else’s phone (ideally opposite of yours – I.e. Android vs. iOS); This was a memo in response to: “Androids can’t download Adobe Spark apps” and “Could not print AR hyperphotos from their phone...had to do it from my phone”

57. **Suggestion – Class Variation**
Having multiple variations of the course is noted as potentially beneficial (i.e. introductory and mastery opportunities, topic variety).

• **Memo:** Different variations of the class would be good: This one was good as an intro to show them what is out there, but not a good opportunity for mastery.
• Observation: “They are interested in real advanced programs, not just the simple apps you can do on your phone”

58. Suggestion – Encourage Outside Practice
It’s suggested to have participants practice what they are learning outside of class.
• Observation: Participants said they were “open to having ‘homework’ and giving them something to take home and read”
• Observation: “The participant who downloaded the app and experimented with it ahead of time seemed to enjoy the workshop most.” This implies that outside practice may be beneficial for participants’ enjoyment of the course.

59. Suggestion – Extend Class Duration
It’s suggested or implied, by a participant or facilitator, to consider extending the class duration.
• Observation: “Could have kept going...felt a bit short on time”
• Participant Feedback: “…a one hour class is not enough. We need two hours.”

60. Suggestion – Isolate Sound
It’s suggested to isolate sound from the main video project for future courses.
• Memo: A memo was written that suggested potentially isolating sound elements, directly in response to this feedback.
• Observation: “Maybe we should offer headphones if they want to hear sound?” This was in response to noticing that the sound was distracting.

61. Suggestion – Keep Class Moving
A way is suggested to keep class moving or better manage the time in the future.
• Observation: “Trying to capture the photos before giving instruction so the participant using my phone would have her photos (everyone else just got really far ahead); should’ve just let her try it with other photos already on my phone first and swapped it later.” This was noted as something that did not work well.
• Observation: “Ran out of time to go through all the photography terms AND take photos....managed to squeeze photo taking in at the end.”

62. Suggestion – Multiple Levels
It’s expressed/implied that having multiple skill levels of multimedia digital art courses would be beneficial in the future.
• Memo: May be worth having course offered at different levels. Participants who attended the class were fairly familiar with smartphones already. However, not all residents are. I had the “Straight A Students”.
• Observation: “They are interested in real advanced programs, not just the simple apps you can do on your phone.”

63. Suggestion – Outside Class Participation (Participant)
A way is suggested, by a participant or facilitator, to have participants do as much as possible outside of class to be better prepare for and optimize class time.
• Observation: One participant downloaded video app ahead of time and explored it on her own first. “This seemed to allow her to enjoy herself a bit more than the other two in this week’s class. She was able to come with specific questions in mind and show off what she had already done at the beginning of class.”
• **Volunteer Feedback**: “give instructions on how to set up their devices to be ready for the class just because a large portion of the class was spent on bringing everyone up to speed on what they need to download, connect to, etc.” She is implying that participants should download and prepare ahead of class.

### 64. Suggestion – Outside Class Preparation (Facilitator)
A way is noted, by a participant or facilitator, for the facilitator to better prepare participants for the next class.

• **Volunteer Feedback**: “…have a guide supplied to the participants before the course as to what we will be working on (apps & software) and give instructions on how to set up their devices…” She is suggesting handouts prior to class (rather than during class).

### 65. Suggestion – Simplify Project
It’s suggested, by participant or facilitator, to simplify the project.

• **Participant Feedback**: “There was so much to learn it might have helped to have us all choose a certain # of photos and work through the program effect by effect so we can do it all at the same time. It was too confusing today to me.”

### 66. Tackle Current Challenge
Participants appear empowered/ready to tackle the technical challenge at hand.

• **Observation**: “Participants felt confident and ready to tackle the project at hand” (Photo Editing)

### 67. Teaching Others
Participants were observed or noted helping other people (i.e. classmates, family members, fellow residents) learn the skill they just learned from class.

• **Observation**: “Participants helped each other figure things out. As they went to try to do something, they informed the others how to do it once they learned (shared the info they learned); 1 of the participants gave some random people who walked in near the end an impromptu photography lesson based off what she just learned”

• **Participant Feedback**: “I love...sharing such cool technology with my family.”

### 68. Technology Adoption Factor
Factors of older adult adoption of technology (as described by Pheeraphuttharangkoon et al., 2014) were present and potentially positively impacted participants’ perspectives on using the smartphone.

• **Observability**: All participants owned smartphones

• **Compatibility**: Digital Scrapbook page particularly relevant to participants’ lives because they all took a scrapbook course; AR print directly applicable to scrapbooking hobby

• **Social Influence**: **Participant Feedback**: “We have a lot of classes together, and we always talk about this one.”; participant shared edited photo with her daughter immediately

• **Facilitating Condition**: Participants asked a lot of questions (generally technical), which the facilitators were able to answer

• **Effort Expectancy**: Participants appeared to believe in their capability to learn each new app (i.e. photo editing)

• **Enjoyment**: Participants appeared to enjoy photo editing

• **Behavioral Intention**: All participants very much wanted to learn about AR, which they noted as their favorite project
69. Technical Difficulty/Unnecessary Obstacle
An issue was noted that negatively impacted the efficiency of class, enjoyment of participants, or facilitator’s stress level. This unnecessary obstacle was not the fault of the facilitator, but extra attention should be given to these details to improve efficiency in the future.

- Observation: “Wi-Fi”; The Wi-Fi was not working properly in the room like it should have been.

70. Technology Awareness
Participants appeared already aware of a newer technology.

- Observation: “AR idea came from them! Pleasantly surprised!”

71. Technology Awareness, But Lacking Knowledge
Participants were aware of new technology, but lacked knowledge to use it.

- Observation: “Appear capable of utilizing apps, but unsure of what apps to try to use; need someone to tell them about the apps that are out there”
- Memo: Participants could describe the technology, but not what it was called (AR).

72. Technology Use
It’s implied that a participant already utilizes and feels fairly comfortable with applicable technological tools (i.e. smartphone).

- Observation: “Participants brought their own phone…”
- Participant Feedback: “She showed me many things on my android camera phone that I didn’t know about.” This implies that the participant owns a smartphone that she is generally comfortable using.

73. Too Complex
The project appeared too complex for participants.

- Participant Feedback: “It was too confusing today to me.”
- Participant Feedback: “Quik – Need instruction manual.” This implies that it was so complex that participants needed an instruction manual to feel capable of using it.

74. Very Hard = Very Good
Participant perceives that a course being “very hard” is “very good”.

- Participant Feedback: Course was “very hard”, “that means it was VERY GOOD!!”
- Participant Feedback: Course was “very hard” = “very good!”

2nd Cycle
Codes below emerged when assigning codes from this codebook (above) to each line of data.

75. Lack of Enjoyment
Participant or facilitator notes something that was frustrating, discouraging, or unenjoyable.

- Participant Feedback: “I didn’t really learn about digital scrapbooking & didn’t enjoy what was taught.”
  On the individual project surveys, this participant said they enjoyed all (except for potentially one project). However, on the course survey, she said she did not enjoy the course.
76. Missed Sought Skill
Participant or facilitator notes a skill that a participant would have liked to learn and/or was expecting to learn, but didn’t.

- **Participant Feedback:** “I didn’t really learn about digital scrapbooking...”

77. Potential Best Practice
A potential best practice is noted for future multimedia digital art courses for older adults.

- **Observation:** “Asking what projects they wanted to do...” was noted as something that worked well.

78. Socialization
Class appeared to be an opportunity for the participants and/or facilitator(s) to socialize.

- **Observation:** “Talking and listening to what they had to say (i.e. stories about a trip they just took pictures at, etc.)...” appeared to work well.

79. Technique Worked
A participant or facilitator notes a specific technique (used by facilitators) that appeared to work well. This does not necessarily imply that approaching it differently wouldn’t work.

- **Observation:** “All 4 of us sat at the same table (I sat with them rather than standing up like an instructor)”

80. Technology Formerly Intimidating
A participant appears to have been intimidated to tackle a technological challenge in the past, but not anymore.

- **Participant Feedback:** “I have PS for my computer and never tried it ’cause it looks so complicated.”
  
  *PS = Photoshop*

81. Time Restricted
A participant or facilitator expresses or implies that they felt the time in the class was restricted.

- **Observation:** “Ran out of time to go through all the photography terms AND take photos....”
- **Observation:** “Talking and listening to what they had to say (i.e. stories about a trip they just took pictures at, etc.), but it took up half the time”

82. Too Easy
Instructions or project appeared too easy for participants.

- **Observation:** “Initial instructions targeted a little lower than the level participants were at, but they still learned stuff”

83. Understanding Multimedia Digital Art (Lacking)
It appears a participant may not have an understanding of multimedia digital art and that all of the projects they made could be considered art.

- **Memo:** When asking a participant what art she wanted to show at the culminating event, the participants stated that she hadn’t made any art in class.

84. Very Open to Using Computer
A participant appears open to using a computer, in addition or instead of a mobile device.
• Observation: “One participant verbally said that she would prefer to do the class on a computer rather than a mobile phone...one that either already has the app downloaded or only download well-trusted apps.”

• Observation: “All participants also seemed comfortable with operating a computer/laptop, as well. Multimedia art classes do not need to be limited to mobile devices...we could consider doing it on computers if we have the proper software available.”

85. Vigilance
A participant appeared cautious toward downloading an app because they were worried about potential viruses.

• Observation: “One participant verbally said that she would prefer to do the class on a computer rather than a mobile phone...one that either already has the app downloaded or only download well-trusted apps. She is cautious to downloading apps because of potential viruses. She is cautious to downloading apps because of potential viruses.”
Appendix G

Categories & Subcategories (Qualitative Data)

**Successes**

1. **Category: Making course practical for participants**
   a) Subcategory: Selecting projects that relate to participants’ lives & interests
   b) Subcategory: Helping participants accomplish personal goals
   c) Subcategory: Applying new skills outside class

2. **Category: Shifting the digital divide**
   a) Subcategory: Recognizing participants existing familiarity with technology
   b) Subcategory: Recognizing factors that help lower the divide
   c) Subcategory: Helping participants feel like they are on the cutting edge
   d) Subcategory: Enhancing participants confidence using technology
   e) Subcategory: Presenting information in a clear & understandable way
   f) Subcategory: Addressing individual questions

3. **Category: Connecting multiple generations**
   a) Subcategory: Believing their family is normally more technologically advanced
   b) Subcategory: Discussing & sharing course projects

4. **Category: Enjoying the lifelong learning process**
   a) Subcategory: Providing an appropriate level of intellectual challenge
   b) Subcategory: Sharing projects
   c) Subcategory: Discovering through exploration
   d) Subcategory: Recognizing participant desire for mastery
   e) Subcategory: Sharing learned knowledge with others
Improvement Opportunities

5. **Category: Participants & facilitator suggesting opportunities for improvement**
   a) Subcategory: Reducing sound distraction
   b) Subcategory: Lowering pressures of time constraints
   c) Subcategory: Simplifying projects as much as possible

6. **Category: Facilitator suggesting opportunities for improvement**
   a) Subcategory: Practicing and prepping more outside class
   b) Subcategory: Offering multiple variations of the course
   c) Subcategory: Ensuring participants have realistic expectations
   d) Subcategory: Taking additional precautions to reduce technical difficulty
   e) Subcategory: Ensuring enough knowledgeable facilitators are present
Appendix H

Proposed Best Practices (Multimedia Digital Art Courses for Older Adults)

1. **Encourage practice and preparation outside class.** Have participants download apps onto their phones prior to class. Provide a guide that participants can take home to prepare for the next class. Encourage participants to explore and practice apps on their own, outside class.

2. **Offer course variety.** This course worked well as an introduction to the types of apps and possibilities that exist. Additional courses that offer an opportunity for mastery in a particular app or technique would enhance the learning experience. Offering classes at multiple skill levels would be ideal, as it is hard to anticipate incoming participants’ existing familiarity with technology otherwise.

3. **Ensure participants have realistic expectations.** Ensure participants have a proper understanding of what the course entails. Warn participants early that technical difficulties may occur occasionally that are out of your control. Inform participants of capabilities and limitations of each app. It is important for them to be able to accomplish what they set forth to accomplish, which is only achievable if it is within the scope of the app itself.

4. **Take precautions to reduce technical difficulty.** Test out projects, prior to facilitating them with participants, on both an Android and iOS device. Apps, features, and user interfaces often differ between different operating systems. This also helps make you aware of any other technical difficulties that may arise.

5. **Ensure enough knowledgeable facilitators are present.** One facilitator for every one to two older adult participants worked best in this pilot course. It was important for the facilitators to be knowledgeable and capable of answering technical questions affiliated with the app being used.
6. **Reduce sound distraction.** Sound elements of the video and AR project were distracting for participants. It is recommended to isolate or eliminate this element in the future.

7. **Simplify projects.** All projects should be simplified as much as possible. Set limits and guidelines for projects to ensure this. For example, ask participants to follow templates or make a limit for the number of photos to bring in for the video project. Include printed handouts that allow participants to follow along in class, as well as practice outside of class.

8. **Select practical & exciting projects.** Ask participants what their interests and goals are and help them accomplish those, when possible. It was observed that most participants came into the course with specific, personal goals in mind. Relate projects to participants’ everyday lives and interests, when possible. It was observed that the more “cutting edge” technology a project used, the more exciting it was for participants in this pilot course.

9. **Provide an appropriate level of intellectual challenge.** Assess participants’ familiarity and comfort with technology, and tailor it to their skill level as much as possible. The project should be mentally stimulating, but not so complex that participants feel they are unable to complete it.

10. **Encourage exploration and discovery.** For some projects, a step-by-step process may work well. For others, it may be more ideal to allow participants to primarily explore an app on their own. Encouraging exploration allows the participants to experiment with the interface and enjoy moments of discovery.
Appendix I

Descriptive Analysis of Quantitative Statistical Measures

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>Numerical Scale</th>
<th>Quantity of Responses</th>
<th>Mean</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>High</th>
<th>Low</th>
<th>Range</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant enjoyment of course (participant perspective)</td>
<td>&quot;I loved it&quot; = 5</td>
<td>3</td>
<td>4.67</td>
<td>5</td>
<td>0.58</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>Participants enjoyed the course as a whole.</td>
</tr>
<tr>
<td></td>
<td>&quot;I liked it&quot; = 4</td>
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<td></td>
<td>&quot;I thought it was OK&quot; = 3</td>
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<td></td>
<td>&quot;I disliked it&quot; = 2</td>
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<td></td>
<td>&quot;I hated it&quot; = 1</td>
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<tr>
<td>Participant enjoyment of digital photography project</td>
<td>&quot;Yes&quot; = 2</td>
<td>1</td>
<td>2.00</td>
<td>2</td>
<td>N/A</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>Volunteer perceived that the participants enjoyed the course as a whole.</td>
</tr>
<tr>
<td></td>
<td>&quot;No&quot; = 1</td>
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<tr>
<td>Participant enjoyment of photo editing project</td>
<td>&quot;Yes&quot; = 3</td>
<td>2</td>
<td>3.00</td>
<td>3</td>
<td>0.00</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>Participants enjoyed the photo editing project.</td>
</tr>
<tr>
<td></td>
<td>&quot;Somewhat&quot; = 2</td>
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<td>&quot;No&quot; = 1</td>
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<tr>
<td>Participant enjoyment of digital scrapbook page project</td>
<td>&quot;Yes&quot; = 3</td>
<td>3</td>
<td>3.00</td>
<td>3</td>
<td>0.00</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>Participants enjoyed the digital scrapbook page project.</td>
</tr>
<tr>
<td></td>
<td>&quot;Somewhat&quot; = 2</td>
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<td>&quot;No&quot; = 1</td>
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<td>Participant enjoyment of video project</td>
<td>&quot;Yes&quot; = 3</td>
<td>3</td>
<td>2.33</td>
<td>2</td>
<td>0.58</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>Participants enjoyed the video project, but not as much as the other projects.</td>
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<td>&quot;Somewhat&quot; = 2</td>
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<tr>
<td>Participant enjoyment of AR project</td>
<td>&quot;Yes&quot; = 3</td>
<td>3</td>
<td>3.00</td>
<td>3</td>
<td>0.00</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>Participants enjoyed the AR hyperphoto project.</td>
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<tr>
<td>Quantity of participants who listed digital photography as a favorite project</td>
<td>1 = 1 participant selected project as a favorite</td>
<td>3</td>
<td>0.00</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Although participants enjoyed this project, it was not considered one of their favorites.</td>
</tr>
<tr>
<td>Quantity of participants who listed photo editing as a favorite project</td>
<td>1 = 1 participant selected project as a favorite</td>
<td>2</td>
<td>0.50</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Half of the participants who attended class considered photo editing as one of their favorite projects.</td>
</tr>
<tr>
<td>Quantity of participants who listed digital scrapbook page as a favorite project</td>
<td>1 = 1 participant selected project as a favorite</td>
<td>3</td>
<td>0.67</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Two of three participants considered digital poster/scrapbook page as one of their favorite projects.</td>
</tr>
<tr>
<td>Quantity of participants who listed video as a favorite project</td>
<td>1 = 1 participant selected project as a favorite</td>
<td>3</td>
<td>0.67</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Two of three participants considered video as one of their favorite projects.</td>
</tr>
<tr>
<td>Quantity of participants who listed AR as a favorite project</td>
<td>1 = 1 participant selected project as a favorite</td>
<td>3</td>
<td>1.00</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>All participants considered the AR Hyperphoto their favorite project.</td>
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<tr>
<td>Participant interest in future, similar courses</td>
<td>&quot;Yes&quot; = 2</td>
<td>3</td>
<td>2.00</td>
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<td>0.00</td>
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<td>2</td>
<td>0</td>
<td>All participants are interested in future, similar courses.</td>
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<tr>
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<td>&quot;No&quot; = 1</td>
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<tr>
<td>Perceived volunteer contribution</td>
<td>&quot;Yes&quot; = 2</td>
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<td>2.00</td>
<td>2</td>
<td>N/A</td>
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<td>0</td>
<td>Volunteer felt she was able to successfully help participants complete their projects.</td>
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<td>&quot;No&quot; = 1</td>
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<tr>
<td>Perceived difficulty level of the course</td>
<td>&quot;Very Easy&quot; = 1</td>
<td>3</td>
<td>4.00</td>
<td>5</td>
<td>1.73</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>Perception of course level difficulty varied. Participants who thought it was &quot;very hard&quot; wrote a qualitative note to clarify that &quot;very hard&quot; meant &quot;very good&quot;.</td>
</tr>
<tr>
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<td>&quot;Easy&quot; = 2</td>
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<td>&quot;Average&quot; = 3</td>
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<td>&quot;Hard&quot; = 4</td>
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<td>&quot;Very Hard&quot; = 5</td>
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<tr>
<td>Quantity of participants who learned new skills</td>
<td>&quot;Yes&quot; = 2</td>
<td>3</td>
<td>2.00</td>
<td>2</td>
<td>0.00</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>All participants felt they learned new skills in the course.</td>
</tr>
<tr>
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<td>&quot;No&quot; = 1</td>
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<tr>
<td>Quantity of participants who plan to use new skills</td>
<td>&quot;Yes&quot; = 3</td>
<td>3</td>
<td>2.67</td>
<td>3</td>
<td>0.58</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>Participants generally plan to use skills learned in class outside of class.</td>
</tr>
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<td>&quot;Maybe&quot; = 2</td>
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<td>&quot;No&quot; = 1</td>
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