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ENHANCING ENGAGEMENT FOR INDIVIDUALS WITH PHYSICAL OR COGNITIVE DECLINE THROUGH THE USE OF MULTISENSORY ACTIVITIES

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Abstract

Traditional care models typically have a pre-scheduled list of activities for elders to engage in for the purpose of leisure, enjoyment and fun. However, questions remain about the long term benefits of such activities and the percentage of residents participate in them. “RenewedMe” is a service design project with the goal of “Enhancing engagement in individuals with cognitive or physical decline through multi-sensory activities”. This project was inspired by the Montessori method principles of education that foster development, engagement and relationships through developmentally appropriate activities. My approach was to create an “environment” that fosters and sustains individualism, builds confidence and sensorial input and output. An array of activities was used to encourage engagement among residents of nursing homes and also between caregivers and friends. By playfully stimulating cognitive and emotional skills, these activities challenged individuals with cognitive decline. This research draws upon a mixture of primary and secondary sources including research, books and primary field research.

Engagement in meaningful social activities is related to ‘quality of life’ for individuals in assistive care environments. “RenewedMe” aims not to discredit the works of recreational coordinators in assistive care environments but rather, its objective is to assist in generating better engagement systems that are more inclusive, interactive and individualized activities that are cognitively beneficial

Enhancing Engagement for Individuals with Physical or Cognitive
Decline through the use of Multisensory Activities.

by

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B.F.A., Edna Manley College of Visual and Performing Arts, 2009

Dissertation

Submitted in partial fulfillment of the requirements for the degree of
Masters of Fine Arts in Collaborative Design.

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Towards Enhancing Engagement for Individuals

The population of America is aging. The empirical evidence is overwhelming and the implications of this 'greying' of America are significant (Olshansky, Goldman, Zheng and Rowe, 852 – 858). America is not unique in experiencing an aging population, as this is a phenomenon that is associated with modern lifestyle changes that are only fairly universal, regardless of cultural and geographical differences from one country to another (Nauert and Johnson, 11) There has been a significant acceleration in the growth of the world's population. After reaching one billion people in 1800, it took only 130 years to add the next billion. Thirty years after, in 1960, another billion persons were added to the population and since then, a billion more people have been added every twelve to thirteen years. With a current population of approximately seven billion people, policy makers expect that by 2050, the world's population will rise to 9.3 billion (Sade, 6). This growth in the world's population, in and of itself, is not alarming, as the Malthusian outlook has largely been debunked by science. (Kenny, 196) However, what this has meant is that the proportion of elderly persons in the population has been increasing, which in turn has created greater demand for nursing homes and assisted living facilities. According to Merriam- Webster dictionary, Assisted living is defined "a system that provides a place to live and medical care for people (such as elderly or disabled people) who need help with daily activities". Concomitant with this, however, is justifiably greater attention being paid to the operation of nursing home. This research aims to build on the growing body of literature on this emerging issue by examining how the elderly in nursing homes respond to attempts to engage them using multi-sensory activities.

To achieve this goal, this paper is organized into three (3) sections. In section one (1), there is discussion about the problems within various environments and how literature describes this project and will conclude with the importance of the research and the suggestions of expanding this project. Also included is an appendix, cited works as well as, included images and interview questions. Before beginning, it is important to examine the problem at hand, to which I now turn.

RESEARCH IMPORTANCE AND RATIONALE

This research explores the nature of multisensory activities that can be used to enhance engagement of individuals with cognitive and physical decline. The issues explored in this research are important because the proliferation of nursing homes, which while satisfying an urgent public need, also raises regulatory and supervisory challenges. The Nursing Home Reform Act (Omnibus Budget Reconciliation Act of 1987) was enacted with the intent of maximizing the quality of life of nursing home residents. Maintaining a resident's level of social engagement (SE) is a key component of this mandate. Thirty years after this law was passed, the quality of life enjoyed by residents in nursing homes still remains an issue. For example, according to Norder, writing in an article on the website of the Atlanta Journal Constitution (AJC), authorities at a nursing home in Georgia found that "patients bordered on starvation at times, and some suffered from severe bedsores and lay in their own waste. Ceiling tiles, soaked with rain, would fall on their beds. The air was so foul, patients kept their windows open to try and get fresh air. Trash piled up outside and the facility was plagued with rodents, mold and mildew".

While procedural and infrastructural breaches related to the built environment of the operation of nursing homes are easily and objectively observed, unfortunately it is significantly more challenging to define, observe and measure instances when the social engagement of residents is less than ideal.

The result is that, even many nursing homes that are regarded as providing satisfactory care may still be deficient in this regard. In addition, given the cognitive decline being experienced by many older adults in assistive care, it remains a significant challenge for administrators and caregivers to determine what activities and interaction may optimally appeal to residents. Finally, volitional participation of residents is routinely low when attempts are made to engage them in leisure or social activities (Tsai et al, 480).

This research hopes to address some of this uncertainty and withdrawal by exploring different multi-sensory activities that persons experiencing physical or cognitive decline can meaningfully explore in an assistive care setting. It is hoped that by recording and analyzing reactions, this research will help to further illuminate the issue of social engagement of the elderly living with physical or cognitive decline and provide solutions.

Multi-Sensory Activities for Older Adults. A review of the extant literature and various news sources (see, for example, Studenski, 455; Lennartsson and Silverstein, 335) revealed that administrators and caregivers place a high level of priority on leisure

and social activities for residents of nursing homes and make an effort to ensure that these are incorporated into the daily operation of the homes. There is, however, a marked even if unintentional, preference for activities that promote physical movement and socialization as opposed to those that seek to encourage cognitive engagement. (Lee, Lee and Woo, 931 - 932) For example, the literature, points to the increasing inclusion of *tai chi* (Lee, Lee and Woo, 931 - 932)) pilates and yoga (Taskiran et al, 267- 269) and the continued reliance on gardening and television (Hellstrom, Hellstrom, Willman and Fagerstrom, 6) as mainstays of social activities for residents of nursing homes. The use of novel strategy-based activities such as puzzles and tangrams with residents of nursing homes is usually not explored in the extant research. News sources and online blogs also seem to confirm this bias, as they are replete with examples of seniors who part-take in karaoke and bingo.

The reason for this, as the literature suggests, is perhaps related to the fact that “most of the earlier research has focused on designing solutions for enabling the elderly to establish connections outside an elderly care home (e.g. with children or friends). Relatively less attention has been paid to designing solutions for elderly care homes, which help in strengthening social interaction among residents” (Voort et al, 327 – 328). Researchers in Netherlands, however, have done preliminary work in this area were enterprising enough to consider the use of a phone-based app for residents in a nursing home. Using a contextual inquiry (CI) approach, they designed an application aimed at encouraging the social and cognitive engagement of the elderly to support them in nursing homes. The social application (APPOINTMENT) allows users to plan social activities to undertake with fellow residents living within a closed community. The app was designed after conducting extensive user research and evaluation sessions with

residents. The results of the research indicated that the target user group found the new app accessible, easy to use and most importantly quite effective in improving their social lives at the elderly care home (Voort et al, 331). Throughout this experience in (APPOINTMENT), whilst there were gaps in technological advancements of the users, there were systems set in place to aid the users in how to better use the application. The results however also indicated that “the user group found the app accessible and most importantly quite effective in improving their social lives at the elderly care home”. (Voort et al, 331) The results also showed that the “APPOINTMENT” app has an understandable design with very good readability and all participants were able to understand the ecosystem of both apps.

Though limited by the fact that it took place in only one nursing home with a sample of only fourteen persons, provides preliminary evidence that the elderly living in nursing homes can be engaged with appropriate, cognitively challenging activities that will arouse and capture their interest while attempting to arrest their cognitive decline. Such examples of cognitively challenging activities are crossword puzzles, learning new languages, computerized games and good old pen and paper. (McEntee) The current project (RenewedMe), therefore, seeks to go beyond leisure activities (knitting, crocheting, watching television, etc.), which in and of themselves may be solitary activities that do not promote engagement and instead explore the suitability of activities that have the two fold effect of presenting a cognitive challenge to the individuals while promoting meaningful engagement.

The ability to maintain mental vitality into late adulthood and function independently are major goals of most older Americans. It is widely accepted that greater

levels of engagement are related to many positive outcomes in older adults. (National Research Council) The importance of engagement in the elderly population has come under scrutiny in the last few decades since studies (such as Kiely and Flacker, 474 - 475; Zhao and Chen, 95) have revealed that poor social engagement results in poor quality of life. Higher levels of social engagement have been associated with higher levels of well-being and longer survival in the elderly, especially those in nursing homes. (Tsai et al, 479) Several factors have shown to inhibit elderly social engagement, such as functional impairment in the activities of daily living (ADL), poor cognitive functions as well as sensory impairment that inhibits communication. (Tsai et al, 478) In addition, the elderly having experienced the loss of loved ones and a decrease in their health will have increased social isolation and feelings of loneliness. (Fry, 741 - 742) The transition to a long-term care facility is a significant life event, which can leave individuals in an unfamiliar state of dependency on others and the relocation, may only serve to exacerbate their physical and mental disabilities (Nauert and Johnson, 11).

Developing activities that appeal to elderly residents in assistive care homes, despite their illnesses, mental and emotional states and their life cycle changes is therefore, a complicated task. These meaningful activities present many benefits such as heightened mood, independence, a sense of self to name a few. However, given the benefits of high levels of social engagement of the older adults, it is important that they be given the opportunity and encouraged to engage in such activities. Unfortunately, assistive care caregivers and administrators seem preoccupied with physical and leisure activities without sufficient discrimination between those that require low levels of cognitive effort and those that require high levels of cognitive effort. (Jacelon, 541 - 545) RenewedMe seeks to address this problem of enticing the individuals to participate in

meaningful activities by identifying how individuals with physical or cognitive decline, in assistive care, respond to multisensory activities that promote meaningful engagement. This project aims to look across the lifespan by focusing primarily at adults with these declines. Unfortunately, literature primarily focuses on “older adults with decline” as opposed to “age related decline”. “Older adults with decline” refers to a group of individuals that are within the age range for 50 and older; as opposed to “age related decline” focuses primarily on all individuals with decline across the age spectrum.

As humans we develop some degree of decline whether, physical or cognitive. Some of the most common symptoms are forgetfulness, lack of focus, decrease problem solving abilities, or other as a result of diseases. (Chappell, Cooke, 1- 6) Individuals who have physical or cognitive decline tend to be isolated and depressed and are placed in assistive living environments that seek to provide support. However, there are still a number of factors that have been associated with decline in functional outcome measures. (Byles, Sibbritt & Regan, 382 -388) Whether individuals with age-related disabilities reside in community or institutional dwellings, the physical environment serves as a valuable resource by which their remaining cognitive and physical abilities can be supported. (Chappell, Cooke, 1- 6)

Studies show that with social support there is a decrease in depression, and a reduction in both life expectancy and immune functioning. Social interaction refers to “a particular form of actions of a reference group that affect an individual's preferences”. (Scheinkman, 1-11) The reference is dependent on the context, which is usually family, friends and peers. Research suggests that engagement in meaningful and productive activities, often within the context of friendship, kinship, and organizational participation, is a key component in promoting health and reducing the risk of mortality in later life.

(Lennartsson, Silverstein, 336) Enhancing older adults social network and engagement appear to be supportive in social isolation and loneliness. (Voort et al, 331) By generating a level of engagement creating multi-sensory experiences would help to target all agents of both physical and cognitive meaningful play. Through multisensory engagement the objectives of this project will focus on:

- Creating a multi-sensory environment that enriches and fosters a sense of independence a happy, healthy lifestyle.
- The use of iconographic symbols and colors, music and interactions with different textures to help with memory, mood and overall happiness or well-being.

Doing this therefore requires adapting the Montessori principles as a foundation to create activities that help to build self- confidence, self worth and independence.

The Montessori Method. The Montessori approach, originally designed for young children, is based on the notion that learning is most effectively promoted through meaningful play and the exercise of volitional strategies. (Wentworth, 12- 17) Volitional strategies refer to the learner's freedom to choose materials and activities with which they want to engage and to explore these activities and materials freely based on their individual interest. While the principles of education developed and popularized by Maria Montessori have always been seen as a meaningful program for young children. However, for example Femia (24), the framework and evaluation of the Montessori based activities have been applied to research context in which adults, particularly Alzheimer's patients are the intended learners or beneficiaries. The Montessori approach, however, espouses ideas that are consistent with approaches that may work best for engaging adults, especially the elderly. Given the cognitive decline experienced by many older

adults, the basic tenets of the Montessori approach coincide with the physical, cognitive and social needs that the elderly experience. For example, the program's emphasis on orderliness, independence, self-directed learning, and a calm environment is consistent with the learning needs of older adults, many of whom are required to acquire new social skills and encounter new experience after transitioning to nursing homes (Peng & Md-Yunus, 300).

The emphasis on open, volitional engagement in the Montessori approach creates an environment that presumably would allow the elderly to pursue activities that are aligned to their interests and that promote meaningful engagement. "Meaningful play is play with an objective for the user objective for the user to learn and explore content or ideas in a fun or enjoyable way". In many cases the intended activity or action focuses on creating an experience rather than with the game itself. (Scott, 1-8) One of the primary benefits of a Montessori background is the fact that these activities focus on the experience that the individuals encounter. "The essential objective of Montessori was motivating and fostering physical and sensory abilities of learners through carefully designed and personalized activities that encourage the use of purposeful tools and the development of the complete learner". (Mofidi, 32) Emphasis on personalization and multi-sensory engagement is consistent with materials, activities and tasks with which individuals engage. This foundational principle of the Montessori approach to learning is the notion of self-correcting activities that are intended to ensure that, based on the design of activities and tasks, learners notice when they make a mistake and are able to correct themselves through trial and error (Lillard, 158). This element of independent learning and auto-correction promotes self-direction, independence, reminds them of their individuality and affirms their dignity.

HISTORICAL CONTEXT

The ability to maintain mental vitality into late adulthood and function independently are major goals of most older Americans. (Reinhard, 233, 234) The triumphs of modern medicine have made long life and prolonged physical and mental wellness a realistic expectation of most citizens of developed countries, America included. Associated with this however, is the continued popularity of assisted living, which have become common place and virtually an indispensable feature of modern society. (Tseng & Wang, 304) “As people become more job oriented or more professional they tend not to have the time to take care of the aging loved ones however, those who can afford to, opt for assistive care”. (“Context of Family Life”) Due to the variety of levels of medical assistance available, many families trust the care of their aging individuals to professionals. As the elderly transition from care provided by family and friends in the familiar environment of home, however, to institutionalized care, concerns arise about the impact that this has on their mental and physical health. Kiely and Flacker (472), for example, pointed out that “transitioning to nursing home life involves a significant disruption of a resident’s previous relationships with family and friends and shifts control of a resident’s life to the institution. Loss of control associated with institutionalization may result in a resident’s disengaging from social and other activities”. (Scheinkman 1-8) For this reason, the nature and quality of the engagement of older adults in nursing homes has been a recurring theme of the research literature in recent times. (See, for example, Lee, Lee & Park, 124 - 132; Zhao & Chen, 92 - 101; Lennartsson & Silverstein, 335 - 342; Thanakwang & Soonthorndhada, 472 - 479; Hjaltadottir & Gustafsdottir, 48 - 55)

In examining literature, (Voort et al, 327 - 328) observed that most of the earlier research has focused on examining the engagement of the elderly outside an elderly care home (such as with children or friends). Relatively less attention has been paid on exploring the manner in which elderly residents of nursing homes are engaged. Additionally, (Maselko et al, 1707) pointed to various deficiencies in the methodology used to study engagement which have resulted in inconsistencies in the research findings. These inconsistencies relate to the definition of engagement and the distinction between engagements that are individualistic in nature versus those that are more socially driven. (Roanova, Keating & Eales, 25 - 27) For this reason, other studies (such as Singh-Manoux, Richards and Marmot, 909) have been executed by examining a matrix for activities that fall into multiple categories, such as low versus high cognitive effort and, simultaneously, social versus individual.

Towards a Definition of Engagement. The extant research, with very few exceptions, confirms what appears to be, intuitive and logical, that improved and sustained social, cognitive and physical engagement of the elderly improves their quality of life. (See for example, Bukov, Maas & Lampert, 510 - 517; Mendes de Leon, Glass, & Berkman, 633 - 642; Mitka, 2437 - 2439) This, notwithstanding the difficulties in identifying what is meant by engagement. From review of the literature, it is clear that great attention has been given to research focusing on social engagement as opposed to mental or physical meaningful engagement and its benefits outside the scope of dementia patients. Thanakwang, Soonthorndhada and Mongkolprasoet (472 - 479), for example, explored how social interaction with friends and family enhance healthy aging and Tiong, Yap, Koh, Fong & Luo (724 - 731) examined contact and its relationship to depression among the elderly. For example The reason for this focus on social engagement at the

expense of mental or physical engagement as Derange et al (863) argue is that sharp distinctions can more easily be made between social engagement (such as playing games) and individual engagement (such as crocheting); on the other hand, activities which promote high versus low cognitive engagement exist more on a continuum rather than in discrete states. Engagement is defined by (Tsai et al 478) to mean performance of meaningful activities for either leisure or productive purposes. It is important, they point out that, engagement not only manifests itself in persons participating in activities as a part of a schedule but that they also voluntarily initiate interaction and engagement with others.

Researchers, such as Dhurup (58) believe that engagement is not synonymous with the pursuit of leisure activities. Leisure is described in general terms as “activities other than work, which may include ‘free time’ allowing a release from occupational responsibilities, forms of relaxation such as recreation and hobbies and various creative pursuits”. (Dhurup, 58- 59) While some leisure activities do not necessarily promote engagement of any sort, as they are solitary, sedentary or reflective in nature, others may support high levels of engagement as these activities encourage the elderly to frequently and meaningfully interact with others and their environment. Indeed, “leisure and productive activities are often performed within the context of social relationships that would facilitate meaningful social and mental engagement” (Lennartsson and Silverstein, 336). This distinction between leisure activities and social or mental engagement is important to this research as it is intended to pursue it in order to understand how it works so that it can be employed to further enhance and improve engagement.

Engaging the Elderly: In general, research on engagement among the elderly shows a marked preference for examining social engagement as opposed to mental and physical engagement. There is significant evidence from the literature in support of the notion that the elderly facing cognitive decline can be meaningfully engaged in worthwhile activities. Nauert and Johnson (10), for example, showed that 73 to 98 year olds in a nursing home, some of whom were experiencing cognitive decline, could meaningfully participate in novel activities such as music and dance therapy for a period of 8 weeks. In addition, (Leung 40), over a 10 month period, actively engaged 788 elderly persons with early signs of dementia in intellectual, social, recreational and physical activities. These activities included computer (internet) usage, investing in and following the stock market, learning to play a musical instrument, staging and performing in dramatic productions, calisthenics and writing. Similar research has confirmed that with the correct prompting and the appropriate adjustments to the design of tasks and or activities, the elderly even those in nursing homes can be meaningfully engaged. (Voort et al, Hellstrom, Hellstrom and Fagerstrom, Kameyama et al and Gow, Mortensen and Avlund)

In trying to determine what the body of research on aging has revealed about engaging the elderly, it is important to note from the outset that some researchers have shown that engagement may have a negative or minimal impact on the quality of life lived by the elderly. As National Research Council (US) Committee on Aging Frontiers in Social Psychology, Personality, and Adult Developmental Psychology argued, "Social activities do not inevitably lead to meaningful engagement with others. Moreover, social ties are not always positive, and it is important to recognize that increased engagement may not reliably enhance life satisfaction, as engagement with

other people has the potential to be stressful as well as supportive” (73). It is also not clear whether a specific type of activity is best for maintaining cognitive function or whether all activities are equally beneficial, as long as an individual is engaged. For example, (Verghese, Lipton & Katz (2508 - 2516) found that mental decline in elderly was arrested by participation in cognitive but not physical activities, even when these physical activities were new to adults and required significant effort to learn them. Leung et al obtained similar results. Also, Hellstrom, Hellstrom, Willman & Fagerstrom (4), found that elderly men and women experienced fewer sleep disturbances after engaging in activities of a socio-intellectual nature (such as playing games and surfing the internet), but not after engaging in creative, cultural and physical activities. This led them to conclude that the frequency or number of activities performed was of less importance than the type of activities performed. (Hellstrom, Hellstrom, Willman & Fagerstrom 4)

Hjaltadottir and Gustafsdottir (52) have carried out research that have illuminated the type of engagement that is likely to benefit and interest elderly adults in nursing homes. Employing a qualitative approach, which involved carrying out repeated interviews of eight (8) frail but lucid residents of nursing homes, they discovered that “it was important for the participants to find activities that were valuable to them and they could handle in spite of failing health”. These meaningful activities were usually those that were closely related to the lives they lived or the interests they had before admission to the nursing homes. Despite this, however, the participants in the survey were all keen on having new experiences or developing new skills once they were physically able to do so. The research of Wolff (169), carried out using three thousand four hundred and sixty-four (3,464) residents of nursing homes in France, also helps to define the kind

engagement that benefits residents of nursing homes. Not only did the research show that residents of nursing homes participated meaningfully in activities designed to encourage friendship, but that “both satisfaction with living conditions [in nursing homes] and feelings of sadness or depression are much more influenced by making friends in the institution than by visits from family and relatives or by any other individual background characteristics”. From these results, it appears intuitive to conclude that any engagement that promotes close bonds between residents should be encouraged.

Research from Nikmat and Al- Mashoor (32) has also proven instructive with respect to engaging elders in nursing homes. From their survey of one hundred and ten (110) persons with cognitive impairment living in nursing homes, they found that slightly more than a third of respondents had not met the needs with respect to engaging in meaningful daytime activities. They also found that participants with moderate to severe cognitive impairment had unfulfilled needs when compared to those with mild to moderate cognitive impairment. Daytime activities, as opposed to those that are performed between dinner and bedtime are those that are most likely to capitalize on opportunities to socialize with others. (Nikmat and Al- Mashoor, 32) However, as Nikmat and Al -Mashoor found, these activities are unfortunately not seen as appropriate for elderly residents experiencing cognitive decline.

Multisensory Techniques. Human beings learn through different modalities and learning styles. Each person uses multiple "learning channels," and each person has strengths in terms of which learning style works best. It is essential that the individual primarily use his or her learning style strengths and talents are used to improve acquired information. (Multi-sensory Learning) Multisensory techniques can be categorized in many ways for some reflections on the necessity of using both the "left brain" (e.g.,

verbal, auditory, sequential, logical) and "right brain" (e.g., creative, artistic, visual, spatial, and emotional) are important. If a student adds the creative process to learning new information, the process helps in better understanding and retention. Secondly, indications of the importance of using all of the senses including visual (sight), auditory (hearing), kinesthetic tactile (touch and balance), gustatory (taste), and olfactory (smell) as much as possible are vital to enhance learning and retention. (Multi-sensory Learning) Educators and clinicians have long believed that multisensory training can enhance learning.

A simple advantage of multisensory training is that it can engage individuals with different learning styles for example some people are “visual learners” and others are “auditory learners”. (Shams, Seitz, 411-417). Another such example of a learning style is mental imagery. This is a perception-like experience based on memories with no concurrent sensory input. Color plays an important role in visual memories. Strong memories of color can develop for a wide range of objects or events through learning associations between visual features presented together within the environment (Chang, Lewis, Pearson, 4). Colors with a positive association would trigger an approach motivation, while colors with a negative association would trigger an avoidance motivation. Moods and emotions are a conscious way to evoke the approach and avoidance motivations. Positive moods have been shown to increase the performance on some cognitive tasks and to decrease the performance on others. Being in a positive mood has been shown to enhance tasks that involve creativity, and those that involve the recall of happy memories. Color has value beyond aesthetics. Yes, we all have preferences, but why? The feelings of happiness tend to increase the tendency to generate free associations and can then increase the ability to solve insight problems.

("The Effect of Color on Conscious and Unconscious Cognition.") As seen in Color chart (See appendix A 1.1) it gives a detailed explanation of color and their meanings.

Effects of Isolation. Social isolation is a major health problem among community dwelling adults, which leads to numerous detrimental health conditions. (Nicholson 137-152) Social isolation is defined as being a “state in which the individual lacks a sense of belonging socially, lacks engagement with others, has a minimal number of social contacts and deficient in fulfilling quality relationships”. (Nicholson, 137- 152) This decrease in health can lead to decline in physical and cognitive functions; it is a common feature of older age and has important outcomes in terms of physical health-related quality of life, falls, health care use, admission to residential care and mortality. (Byles, Sibbritt & Regan, 382 -388)

Current estimates of the prevalence of social isolation in community dwelling individuals are as high as forty-three percent (43%). If detected early, future mortality could be avoided through prevention. However, routine assessments are not conducted in primary care settings and therefore often go undetected. (Nicholson, 137- 152). There are numerous variable associated with social isolation. These risk factors for social isolation and include; physical, psychological, economic, family/work changes and environmental (Nicholson, 137-152). Currently in assistive care environments there are scheduled activities for engagement, some of which attempt to provide encouragement in fun activities. Activities that are “less engaging” can lead to boredom, which often causes problems such as aggression, agitation and withdrawal. (“What a Difference a day makes”) On the other hand activities that are engaging can be effective forms of social interaction thus leading to greater improvements in mood and behavior. (Femia, 1-39)

A review of the available literature and research material has revealed that the emerging body of work on engagement of the elderly is still struggling to develop a sound methodology and is seeking consensus on definitional issues surrounding the term engagement. (Kiely & Flacker, 472) What research has been done in the area, however, has confirmed with very little exception, that adults with cognitive impairment may benefit from meaningful engagement as long as it is the right type. (Tsai, Ouyang, Chen, Lan, Hwang, Yang & Su, 478 - 479; Zhao & Chen, 93) Researchers Zhao and Chen (96) have shown that elderly residents in nursing homes are likely to participate meaningfully if they feel that the activity is aligned to their interests or if the activity provides them with a chance to learn something novel and exciting; (see for example Tak; Kedia, Tongumpun, Hee Hong).

CONCEPTUAL DESIGN AND PROTOTYPING

Creating an experience for individuals with physical or cognitive decline started with defining what is engagement. According to the Oxford Dictionary, engagement has been defined as “the act of “participating”; an arrangement to do something or go somewhere at a fixed time”. Within the scope of this project, engagement is synonymous with participating and therefore, the objective is to seek to determine how individuals respond or involve themselves not just physically but also mentally as well. This widens the option of defining how they involve themselves in an activity. These options include observing, interacting with objects and interacting with peers. Once there is a level of enjoyment and cognitive benefits, there is a level of positive engagement. In trying to understand what individuals with physical and cognitive decline need in order to enhance participation, I had to learn about their experiences and it was in Spring 2015 that this journey began.

I had the opportunity of visiting five types of assistive care facilities. These facilities included nursing homes, independent living, assisted living, residential care, skilled nursing and cottages (green house model). Throughout this process I was introduced to the concept of participation. My interest in designing a suitable environment was however strongly influenced by a project I did in Spring 2015. That project focused on “*How we can create multisensory experiences for elders in nursing homes*” especially Alzheimer’s patients in Loretto, Syracuse, New York. After much observation I realized that there were overlapping patterns that existed within each of these assistive care facilities. Some of these patterns were:

1. Elders having an interest only if a friend had an interest
2. The accessibility of the location
3. The level of interest generated in the activity

My design at the time incorporated the use of cards with iconographic symbols that were representations of the activities the participants elected to do for the day. Each card had a different scent and texture, which played a critical role in the selection process. In ten (10) minute increments users were reminded based on the scent or a token of the activity, and was led to the space using way finding materials (see appendix A 1.2). While the results were successful, and user participated and told peers about what had happened there were also multiple insights that came with this experience. Considering that the participants were dementia patients, it was a lot harder to keep their attention. To ensure they were engaged, considerations of mood, time of day and stage of cognitive decline were critical parts of this experience; that needed to be addressed. After much reflection, I realized this could be done through trying to understand who these

individuals were before their disease and who they currently are, what has decline and what would be best to try and maintain cognitively. .

Since the “*Multiple Experiences*” project I had time to reflect on how to create a suitable environment for elders. Since that numerous interviews and observations gained insight into the characteristics of the existing system of assistive care and I was able to look beyond the scope of my previous research. Deeper analysis of the current organized activities has led me to conclude that they are created under the conviction that “one cap fits all”. Who says that we are all the same, have the same interest, strengths and weaknesses? Within the assistive care system, my understanding is such that because residents are under the same roof with health issues, their problems and therefore their interests are the same. There are scheduled activities available, and there were elders who participated however, the majority declined the opportunity to part-take in these activities. do so. Upon further reflection, I came to the conclusion that this is possibly due to the lack of interest in the scheduled activities. Other reasons that could be associated with the lack of participation could be depression, fear and other dexterity issues that may contribute. How was I going to solve these issues? The more I thought about it, the more sense it made that the Montessori learning model can be applied to this environment to increase fine motor skills, build self-esteem in the individual with its no-fail methods and emphasis on repetition that fosters concentration and independent work, among other things.

The concepts of interaction and interest were issues with which I constantly battled. According to Merriam- Webster interest is defined as “a feeling of wanting to learn more about something or to be involved in something”. On the other hand interaction is defined as “reciprocal action or influence.”; but what makes them so

predominantly important is that if one has an area of interest if not properly communicated or interesting enough they may elect not to interact with it. Some questions that I was often bombarded with were, what influences interaction within these communities? How can activities successfully interest an individual to interact? What kinds of activities can support an individual within group settings? What kinds of benefits are there in particular activities? What kinds of connections are there between the aging mind and the environment, and how does the environment influence behavior and interaction? What kinds of languages do adults with decline relate to? Language become important role in how we communicate as we age as, it is harder for individuals to remember words when engaged in conversations for example, people or objects. (“What Is Mild Cognitive Impairment?”) Over the course of the past months, I have used design probes to enhance my research process, to ground my designs and myself in the foundation set by Maria Montessori. Some of these Montessori principles are:

1. Learning occurs in a cooperative atmosphere marked by social interaction and peer teaching.
2. The primary goal of Montessori education is to foster competent, responsible, adaptive citizens who are lifelong learners and problem solvers.
3. Learning takes place through the senses. Students learn by manipulating material and interacting with others. These meaningful experiences are precursors to the abstract understanding of ideas.
4. The individual is considered as a whole. The physical, emotional, social, aesthetic, spiritual, and cognitive needs and interests are inseparable and equally important.

5. Respect and caring attitudes for oneself, others, the environment, and all life is necessary (Dreyer 1- 4).

A popular saying in Jamaica is “once a man twice a child”, which also inspired my concept. If we look at children and how they learn, explore and stay engaged then the same principles could probably be applied to adults. I observed the Montessori Discovery School (MDS), Syracuse NY, and was fascinated by the approach of free will and self-directed learning. My first concept was to transfer the Montessori activities into activities that declining participants could use. It was important to understand the mindset of each individual to better approach independence and self worth was an important component in understanding individuals. It was through this insight that I realized the overarching pattern that throughout the life course it is important to feel a sense of freedom and independence, which is seen in children, and more so in individuals who are placed in assistive care. One of the main problems found within these environments is a loss of independence, confidence and self worth.

Speaking to persons across the lifespan was also a critical part of the research process. We are all aging and it is important for us to think about what can happen to us as we age, by gaining input from other members of society. This allowed the iterative process to be more open-minded and informative for me as I was able to gain insights and guided the direction of this project. This influenced the direction of the activities in not only being individualized but also group based, which ultimately builds interpersonal communication within environments with caregivers and friends, as well as personal development. The beginning of my design process drew upon design probes to gain insights and feedback from participants.

First Probe: Tangrams. Six (6) students at the (MDS) were selected to participate in the activity cards ranging in ages 3-6. Wooden pieces and cards were placed in front of participants (see appendix A 1.3) to see how they would interact with them. With the teacher present, an introduction was made and they were asked if they are interested in participating in the activity. The cards had various identifiable objects (such as example, a fish, a house), which required each participant to match the shapes with its picture card. Having tested the probe with the Montessori students, it was clear that while it was enjoyable, it needed to consider the range of cognitive abilities of each participant. As a result, it was not ideal to firstly assume that the size of the cards was best (visibility), (see appendix A 1.4) and application of the process and getting use to the shapes would be an ideal first stage. Having cards that were larger so that the participants could place the shape on the cards would have been more appropriate. A range of cards with varying degree of difficulty, for some had proven to be challenging, but others were interested in taking on that challenge, amidst doubting themselves in the process. This activity is heavily tactile and gives the individuals an opportunity to play with objects and explore by trial and error.

After interacting with individuals at the Brown Bag Thesis Presentation in February (see appendix A 1.5), there were a handful of insights that changed my perspective. Engaging with participants from varied age groups, I truly had the opportunity to understand from the perspective of an *aging mind*. I used this opportunity at the presentation to gain feedback from professionals from all walks of life and one of the main insights was that the activity was “childlike”. More importantly, was I going to use an algorithm to measure engagement? The initial thought process was to “bridge the gap between the mind of a child and the mind of elder” which was the original thesis

statement. However, after discussions and reviews from professionals I realized that it might be advisable to not try to bridge the gap but to find similarities that may aid in the further understanding the needs of an aging individual. After battling with the concept of what it means to be childlike, and consulting with occupational and recreational therapists, I came to the conclusion that we are children at heart and our perception on what being a child is different.

My interview with Recreational Therapist Shannon, confirmed my concerns and uncertainty about the child likeness of the tangram activity. One of the many examples she stated was “Coloring is becoming very popular again, especially with adults, which was once seen as something only for children, I like to play in the mud, that’s doesn’t mean it’s child-like, it is what I enjoy. I would say our perceptions are different on what child-like is” (Loughlin, Interview). The activity adopted for use by adults is used to aid in thinking and enjoyment by increasing its complexity. For example, adult coloring books have more detailed designs. (See appendix 1.6)

Moving forward and after further research, discussions and insights I changed the scope of my project with the intent of focusing more on three main areas of cognitive development. Each activity would focus primarily on developing intellectual abilities. Finding activities that promote cognitive training whilst also being stimulating is dependent on the mental capacity of the individual. “Cognitive development is a continuous process of discovering, sorting, classifying, evaluating, visualizing, understanding and information to solve problems”. (Mhcbiofeedback) Through the continuous discovering and understanding of information the activities used there would be some level of cognitive training. Emulating activities that are present in the Montessori system was an important aspect of this project. Considering that Montessori

schools uses the tangram system and it was not appropriate to be used with adults. Finding activities that are used by adults that can be altered to fit the Montessori principles, was the basis of transferring the tangram activity (probe 1) into the puzzle activity (probe 2).

Second Probe: Puzzles. The second iterative process began after receiving feedback from both children and adults across the lifespan spectrum. The first probe was small, and “child- like”, and I wanted to take things a bit further to explore what types of cognitive activities could enhance skills ranging in difficulty while still being entertaining and arouse participants’ interest. Creating a puzzle-based system with tangram like qualities (first probe) would be the stepping-stones on which I used to create the second probe.

This activity uses imagery that was of importance or reference to their interest or things associated with memory that could act as a conversation starter. There are (4) different levels to the activity, which would allow both the Elder and Caregiver or Activities Coordinator to see what advancements are being made based on how the participant progressed at each level. Each image will be reworked in four (4) different ways and advance in difficulty accordingly (see appendix A 1.7). One of the many benefits of this activity is that it allows for a sense of freewill and expression. As seen with participants when they interacted with the activity. The main goal of this activity is to test attention to detail, visual spatiality and sequencing in an effort to build and maintain focus amidst possible distractions.

Studies have found that engaging in challenging cognitive tasks can protect against age-related declines in thinking and the risk of developing Alzheimer’s disease. It is important to keep oneself stimulated through activities such as playing

bridge, reading, and attending adult education courses. (“What Is Mild Cognitive Impairment?”) With the decline in areas such as, problem solving, processing speed, memory, attention and sensory changes the kit is designed to focus on building and maintaining selected areas of cognitive importance. Visual spatiality focuses on reasoning and problem solving, which are traditional ways of approaching solutions that are maintained in older persons. Using images to create a puzzle system is one way of targeting individuals who are primarily visual learners but also, helps with developing problem solving capabilities. The other two (2) areas of importance within the kit are memory and focus. Memory is a crucial part of this kit as decline takes place as person’s age. With memory loss or decline there are other aspects that factor into cognitive decline such as speed processing. Aging does affect the speed with which cognitive and motor processes are performed. Also, attention is a basic but complex cognitive process that has multiple sub-processes specialized for different aspects of attentional processing. Declines in attention can therefore have broad-reaching effects on one’s ability to function adequately and efficiently in everyday life. (Glisky, 2) Simple focused attention such as the ability to attend to a television program tends to be preserved in older age.

Using abstract imagery with high contrast is a critical role in this process. This allowed for a free will and free expression and breaking the general the concept of a puzzle based system. As well as, understanding the individual's interest, this way coordinators can tailor the activity to their interest. For example, if they like music particularly for example 1960’s music then a puzzle system of Elvis would suit their interest or using a photo of their family. I foresee something like that being useful particularly with dementia patients.

After many interviews and significant understanding of my users, I realized that having an assessment system would be ideal in further being able to understand each individual. It was through speaking to Recreational therapist during an interview when I asked her how assessments are completed. It was then I realized it was important that considering that I am focusing on the interest of each individuals that I create an assessment in which would aid in this. Using an assessment system will allow therapist and caregivers to create better activities that are based on the interest of the participants and track their progress. (See appendix B 1.1). A Montessori system isn't developed based on the interest of the individuals; rather it is created primarily based on the fundamental needs of the students. The activities are designed to allow students to pursue those in which they have an interest. I took a step back and questioned how I could develop a system that requires the caregiver to understand who is using the kit as well as, maintaining the fundamentals of each activity within that system? I decided to develop an assessment tool that seeks to help the caregivers in monitoring each participant's physical, cognitive, behavioral and emotional status. The individual's previous education, occupation, as well as interest and goals which gives individuals an opportunity to work in tangent with their caregivers. This was created with the belief that giving these elders a say in some of their goals and interest would make for an easier way to tailor activities to be both individual and group. Considering that they all would have the same underlying factors in each.

Third Probe: Match Cards. The second probe focused primarily on visual spatiality, sequencing and aids with a concept of free-will and expression. The intention for the third probe focuses primarily on memory. In creating this activity reference was made to the Montessori activity; bead counting. (See appendix 1.8) In bead counting the

children counts the beads and try to match the number of beads to the amounts that is on the paper. Moving forward I realized that using a number based activity would be important. Match Cards is a sequential activity, using a range of cards from 0-15, having the participants flip each card accordingly within a given time. Starting with increments of five (5) cards (level 1) after completing that level correctly, an additional card or two is added for difficulty (See Appendix A 1.9). The option of choosing colors from lightest to darkest was an alternative activity in the event the participants did not like using numbers. The time limit for each level varied based on the difficulty levels. The level of difficulty was decided with a baseline notion that the more cards; the more difficult the levels become. However, in determining levels of difficulty per individual, it is between the caregiver and the participants to choose how difficult the activity is based on the level of cognition of the participants. For example, 30 – 45 seconds were apportioned for the easy level and 20 – 40 seconds for the intermediate level. However, depending on each individual’s cognitive level, the caregiver adjusted the timing as well as the number of cards and the range of the cards. The level of interaction can be assessed from some of the responses that came into play, or questions that came from this activity. Some of these were:

1. I’m not comfortable with timing it. Could I do it before trying?
2. The time of day plays a critical part in when activities are played. If the activity is played in the afternoon they may be exhausted or have other interest in activities that does not require so much cognitive “work”.

RESULTS AND OUTCOME

This project is designed to help individuals with physical or cognitive decline to use multi-sensory activities to aid in enhancing engagement. By creating an environment

that support participants individually as well as, within a group; their moods, independence will be maintained. Based on the results and outcomes of this project, a kit has been designed that will act as a template for caregivers to aid in the development of activities for individuals. The “RenewedMe” kit will allow for individuals with decline that are in assistive care to have support outside the concept of the scheduled group based activities. Through self-guided activities, tactile objects and self-interest participants will be able to engage with caregivers and peers. These activities concentrate on maintaining three (3) main areas of cognitive importance focus, memory and visual spatiality that declines as we age. All aging humans will develop some degree of decline in cognitive capacity, usually including the following symptoms:

1. Forgetfulness
2. Decreased ability to maintain focus
3. Decreased problem solving capacity ("Age Related Cognitive Decline.")

With these activities focusing on each of these the hope is that caregivers and participants will be able to integrate more and foster a relationship that will inurn motivate participants to part-take in the activities.

Within the scope of this project engagement was measured by, talking, body language or general interest in activity whether it be repetitive interest in a given activity. Each activity allowed for trial and error and exploration. As seen with both the match cards and the puzzle activity participants engaged with the activity by either discussing it with peers, other participants with caregivers. Also a repetitive display of interest was shown when participants when they worked in teams to solve the problems presented with the activity. This project doesn't seek to pick particular

Benefits of this Design. The philosophy of the Montessori method is to help children to be as independent as possible, able to make choices, while being treated with respect and dignity. It assumes that they want to be independent, show the abilities they have, and learn new ones; so it offers meaningful activities in environments designed to accommodate their needs. This design is aimed at adults who have mental and physical impairments and builds upon the older adult's remaining abilities. As the aging population and the prevalence of dementia increases, facilities serving older adults need to provide improved quality programming to maintain or enhance the quality of life for these individuals. Montessori based activity programs can serve to fill this growing need. Such programs not only provide meaningful activities but also enhance recognition and memory, as well as a sense of completion and success for participants. Moreover, it is important for each individual to use as many channels as possible to best learn, understand, and retain new information. I believe that these activities are meaningful because they have the ability to help individuals with decline to retain information and be

An initial assessment conducted by caregivers allowed for the conversation starter between both parties about interest and current physical, emotional, cognitive, behavioral status. This allowed for both parties (the participant and the caregiver) to set goals and decide what kinds of activities would best suit the individual. The overall concept of this kit was evaluated positively and participants, caregivers and others; the activity as well as having a say in the types of activities they decide to do for that day. Each activity in the kit targets three (3) main target aspects of cognitive functioning; these being; focus, visual spatiality and memory, in addition having physical, individual and group benefits.

I foresee this activity, being altered based on the interest of each participant. Taking into account individualism, it would be interesting to track the development of the participants whilst ensuring that the activities are fun and engaging. Past/ previous professions and interests should act as a conversation starter between but not only, the caregivers but also friends about the variety therefore, forcing them to try each other's activities, making it communal. Taking from the Montessori principles and multisensory facilitation is grounded in the concept of “follow the child”, this project can emulate the standards set by Maria Montessori and “follow the adult”. (Wilmoth, Interview). Developing activities that appeal to elderly residents in assistive care, despite their illnesses, mental and emotional states and their life cycle changes it would be eye opening for the caregiver to have an opportunity to take a “hands-off” approach to engagement. We all learn through different modalities and learning styles, by using multiple "learning channels," each person's' strength can be of great advantage in terms of which learning style works best.

Relevance and Findings. Five clients at Loretto Daybreak Syracuse, within the age of 34-70, with a range of both physical and cognitive decline were selected for the evaluation phase. The “RenewedMe” kit (with 3 activities) was evaluated by participants. The evaluation criteria were to:

- a. Identify individuals who were interested after formal introduction.
- b. Did the users find the activities meaningful?
- c. Did they want to move on to another activity or did they want to redo the activity?
- d. How can the activities be improved upon in terms of usability and interest?

Users were encouraged to explore the activities on their own accord. Caregivers and peers assisted users who encountered difficulties while completing a particular task. Considering that this research is heavily qualitative, engagement was measured based in moods, behaviors, attitudes etc. This concept exemplified that engagement comes in different forms and how one interprets may vary. According to (Nierenberg, Calero, Grayson, 127- 129) The individual significance and meaning of a gesture is sometimes subject to as many interpretations as the number of persons evaluating it. Throughout this experience some of the insights gained were:

1. Timing is important
2. Most organizations have a set list of scheduled activities, the harder ones would be more ideal to have in the morning versus in the afternoon.
3. Illnesses have a large impact on mood and interest; however, it is also the caregiver's duty to entice participants to engage.
4. Participants seek (quick) validation.
5. Depending on difficulty they may or may not be interested in redoing.
6. Variety is important- having similar activities for rotation may be a good solution.
7. Participants sometimes need physical affirmation of good work. For example, a handshake.

Whilst working on the puzzle with Mary, an 87-year-old participant with dementia, June (another participant), came over and asked if she could try one of the puzzles. I set up a puzzle for her and allowed her to explore on her own. I left Mary to explore on her own and monitored from a distance how they interacted as well as tried to read their body language. Mary tried but after a few long minutes one could tell based on her slight

slouch (body language) that she was on the verge of giving up. I intervened and motivated her and to my surprise, she was able to relate the image to a past experience regarding church and fixed about a quarter of the puzzle on her own. June, also experienced some level of difficulty however, she expressed a determination and rejoiced after completion of all levels the puzzle. One of the most interesting highlights of this experience was the fact that whilst June was having difficulty, her peers around the table (age range 37- 65) assisted her in her time of difficulty. The participants' willingness to help each other eventually led to a table conversation about the activity, the difficulties experiences and the observations made. This insight was meaningful as it allowed for the participant to express their difficulty, and discuss after completion what they would have done differently, or interest in activity with their peers; whilst receiving motivation from peers.

On reflection I realized that having a variable upon which engagement is measured could detract from what is really happening considering that as individuals we all respond to situations and our environment differently. Sigmund Freud wrote, "The unconscious of one human being can react upon that of another without passing through the conscious". (Nierenberg, 127-128)

This means that you may subconsciously pass judgment on someone else, basing your judgment not on facts, but on intuition- in other words, on that person's body language. Body language and nonverbal clusters can be a form of measurement and feedback from participants as to what worked and what did not. Facial expressions, including the forehead, eyebrows, eyes, nose, mouth, chin, and jaw must be observed. (Nierenberg, 140-141)

These include:

1. Position of the head.
2. Position of the back and shoulders.
3. Arm and hand movements.
4. Leg and foot movements, including how someone walks, changes in tone of voice and other sounds, such as clearing the throat. (Nierenberg, 140-141)

The importance of colors played an integral role in this design. Mary was able to apply the imagery to church and after much research it showed that “Catholic Church uses deep shades of purple and red, giving the colors a spiritual meaning” (Patel & Puri, 2013).

Match cards were an interesting perspective, as it allowed for individuals to engage and problem solve within a set timing. Throughout this activity participants and their peers were interested in the activity, however, it appeared as a level of difficulty for some. Nick a 37-year-old participant who enjoys cards and puzzles took an interest in the activity. After the first 3 rounds within the easy range, you could see a shift in his mood. He was more confident and excited about the upcoming round, which he requested to continue doing. With the intermediate level, I proceeded to add cards considering that his cognitive decline was not as significant as some of his peers (other participants ranging from ages 42 to 63). However, as it began to get harder, there was apparent shift in his body language and he also stated that he was tired. Nevertheless he was still persistent and continued. After two more attempts in the intermediate level, Nick declined to continue.

Participants, observers and I had a round table discussion after the activity and it was brought to my attention that if the color of the cards were possibly more

interesting, it would entice individuals to continue playing. The time of day has a lot to do with how involved the participants are (activity took place in the afternoon), especially if there is a scheduled list of activities for the day. It would be ideal to concentrate on the harder tasks in the morning. However, throughout Nick's experience his peers provided the moral support he needed during his time of difficulty. Therefore, it can be concluded that meaningful engagement did take place in both the puzzle and match card activities.

Limitations. Throughout the course of this project it was concluded that measuring engagement would be an issue, therefore resulting in this research being primarily qualitative. Using quantitative methods of measurement would take away from the underlying goal, which is to evaluate from an individualistic perspective. This was so because using a quantitative requires a baseline or curve on which engagement is measured, also it would be a comparison done between participants, which would ultimately shift the scope of the project. Currently in Montessori schools while their method of measurements is qualitative, I believe that there are flaws in the system. They measure engagement by looking at:

1. Length of time tools were used by participants.
2. Did the child choose the activity?
3. Was the activity done more than once?
4. Did the participants complete the activity?
5. If the activity is done in a group, who benefited more?
6. Body language (Colton, Interview)

By using these criteria, there is then an assessment of the student. Even though it is not an explicit grading system (for e.g. A, A+, C) there is still a level of grading

involved in the activity. This assessment is based on the teacher's perception of what the child comprehended or learned.

Bearing in mind that individuals display interactions and understandings differently, how can we perceive one's understanding of a topic or how can we judge a person's response? Why is it measured with a baseline score or a grading system? Therefore, it is believed that an empathy-based system would be more ideal to better understand each individual and make adjustments and improvements accordingly. According to Merriam-Webster dictionary, empathy is "the feeling that you understand and share another person's experiences and emotions: the ability to share someone else's feelings". Therefore, this empathy-based system would focus on "illuminating the human factors, which will determine whether people actually delight in the product".

The research conducted, experienced limitations related to the conceptualization and operationalization of important variables. As was the case in similar research carried out by other researchers (such as Maselko et al, 2014; Lennartsson and Silverstein, 2001), identifying a spectrum of cognitively challenging activities for individuals was a difficult task and, ultimately...were made since no standards exist for what can be called "cognitively challenging". This was consistent with the observations made by Maselko et al (20), who pointed out that no well-defined theoretical approaches exist to designate one task as requiring low cognitive effort and another as requiring high cognitive effort. The absence of such a classification system affects the reliability of this research, as the operationalization of 'cognitively challenging' is unlikely to remain stable over time.

CONCLUSION

One of the many unique aspects of this approach is the ability to modify activities based on participants' physical and cognitive ability as well as, a person's cultural background and interest. Mood is one influencer of cognitive training, but is not always a "conscious signal" that an individual is aware that exists. As a result this may influence the interaction whether between other peers or with activities. Participation in activities such as music, exercise or coloring is associated with less depression, better cognition, mobility and balance. (Teri L et al, 391-94)

Color, which has been shown to evoke approach and avoidance motivations and can have the same effect on cognitive task performance as moods and emotions. It has also shown that color has an influence on cognitive performance and may lead to heightened level of engagement. Overall, "RenewedMe" presents as a promising and useful tool that many adults in assistive care can use to engage and improve moods and behaviors. Within the scope of this project, "engagement" is defined as participating in activities that are not only fun but also cognitively beneficial for individuals with decline. This project looked at the abilities of the participants and generated interest based on current abilities while focusing on creating and maintaining abilities that were on the decline. Therefore having a baseline way of measuring engagement would not have been a suitable option for this project. Take for example a person who has always been introverted; that person may not seek to part-take in the activities around others however, observing and showing emotions, is a sign of engagement. Interpreting gestures and body language and communicating with each individual will allow for improvement with the activities as well as generate a level of trust within the environment.

Too often, our efforts are centered on wanting people to participate without giving them the opportunity to make real decisions. We devalue time and relationship building,

which often leads to us more easily devalue the contributions and expertise of those with whom we engage with. (Mehta; "The First Steps to Meaningful Community Engagement.") Hence being able to work in tangent with caregivers to create these activities that will be useful for both individuals and group activities. Being able to have a variety is important, considering that these three activities target particular areas of cognition they also, have the ability to facilitate physical movement, being that variety is important. The main goal of this kit is to allow for caregivers and participants to build strong interpersonal relationships whilst integrating and building on current skills and strengths. In addition, the educational objective of this kit is for participants to demonstrate ability to:

1. Obtain, analyze and reach a decision regarding placement of the puzzle pieces.
2. Understand and make connections to their previous experience based on the image of each puzzle.
3. Test them to complete all levels of the game as well as integrate the Montessori principles.
4. Initiate conversations with peers if done in teams; and help others if it is deemed it necessary.

Being able to measure whether or not participants are completely engaged, may however pose as a challenge, as it is important to note that sometimes measuring engagement is not necessarily the best way to see benefits. Having conversations about the kinds of changes (participants) want to see take place becomes more of a powerful tool.

We are all designers of our future and as our social environments changes we forced to forge new roles and identities in new environments. “Skills don’t have to decline if there is an intervention, once participants feel successful doing something that’s what matters” (Whitaker, Interview). What matters is that participants feel good and successful even if they are in a state of declining skills. (Loughlin, Interview) A limitation of this study is that a small number of the user test conducted as well as, the more subjective the testing became, it was harder to read the levels engagement. Furthermore, being able to test this application over a longer period of time would have been ideal. However, based on the limited user research, I believe that adults with physical or cognitive decline, dementia and other disabilities who face similar problems have an opportunity to benefit from “RenewedMe”.

APPENDIX A

Images of Processes

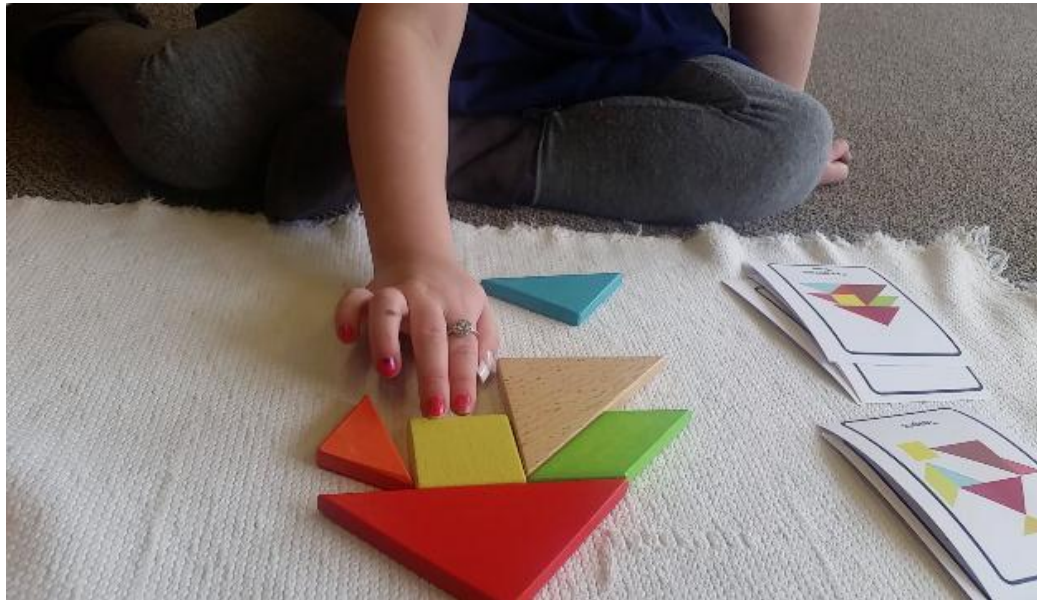
A: 1.1: Figure displaying the color wheel and the meaning that each color represents.



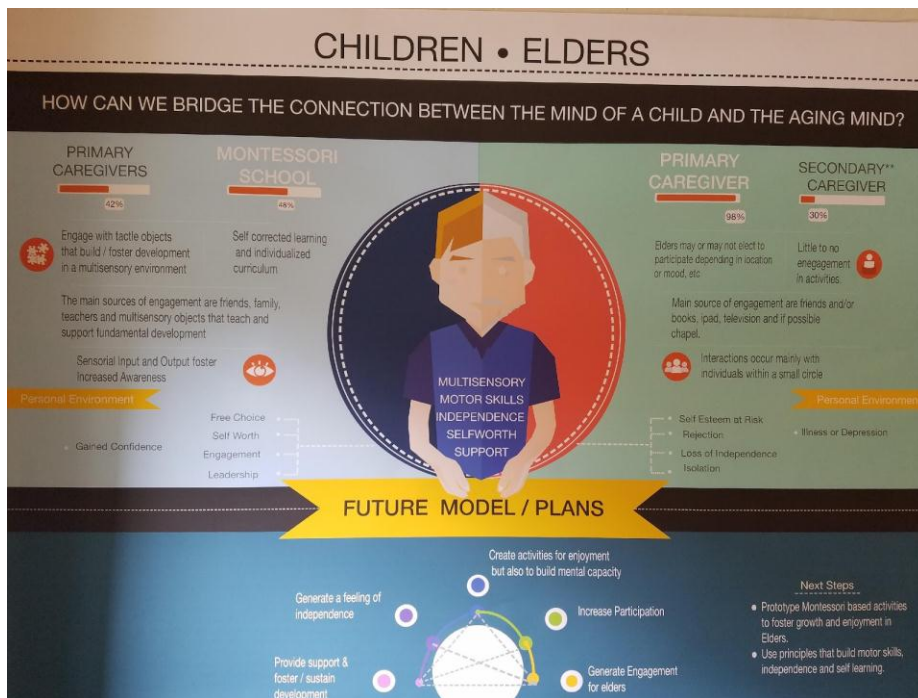
A: 1.2: Figure shows Prototyping details associated with Spring 2015 Project.



A: 1.3 Figure shows Student at Montessori Discovery School interacting with Tangram activity.



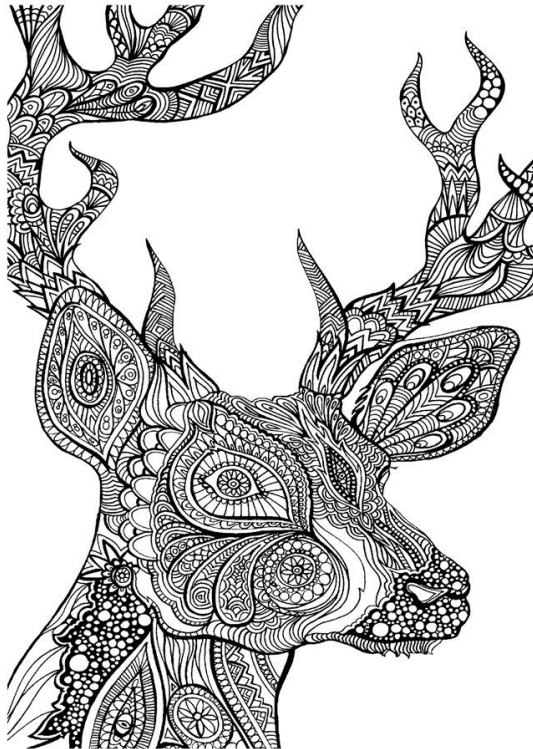
A: 1.4 Poster presented at the Brown Bag Presentation, February.



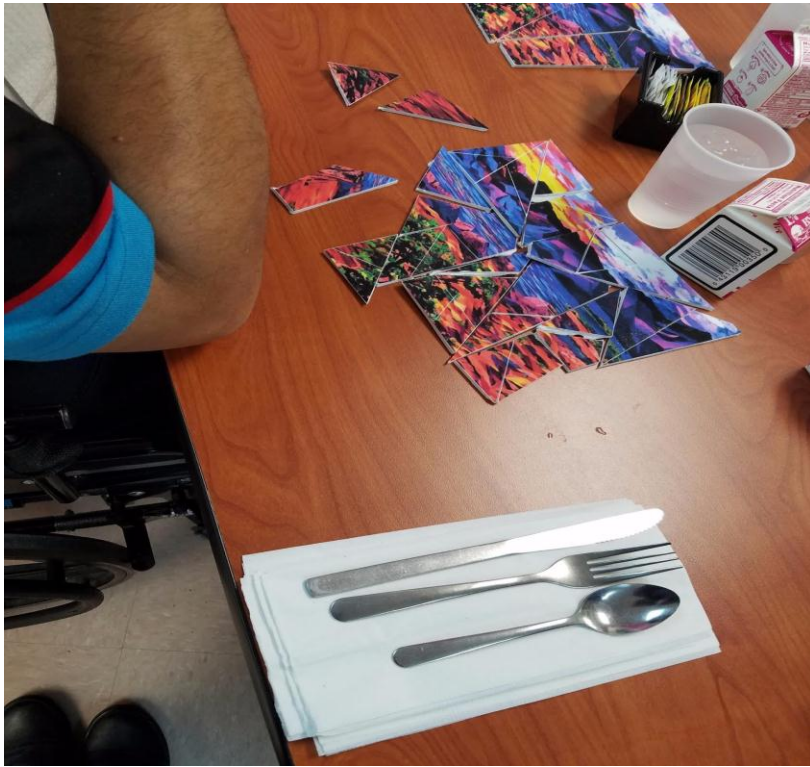
A: 1.5 Tangram activities with larger cards and wooden pieces.



A:1.6 Detailed drawing from adult coloring book.



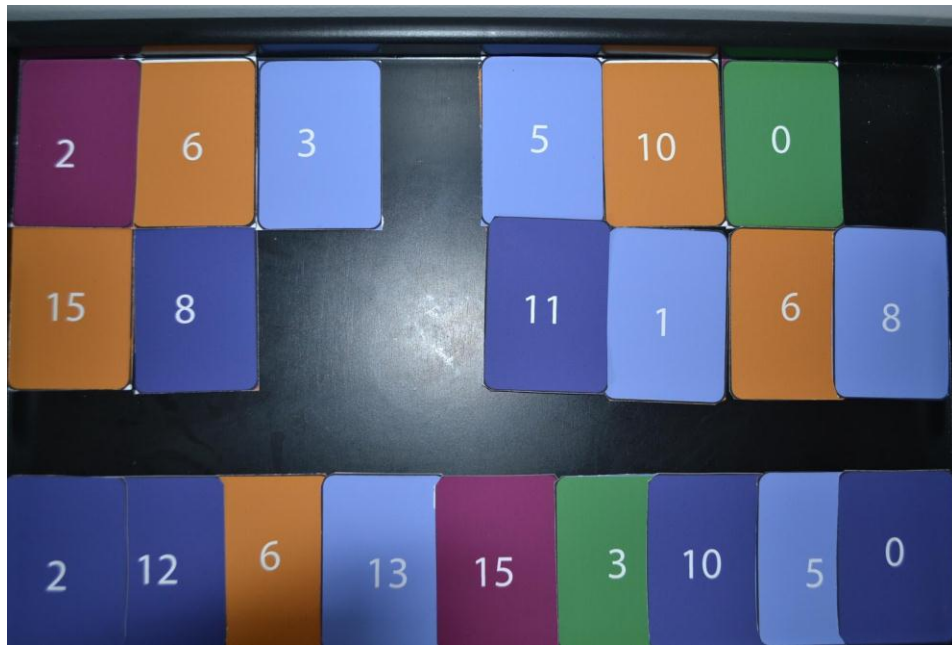
A:1.7 Participant interacting with Probe two (2).

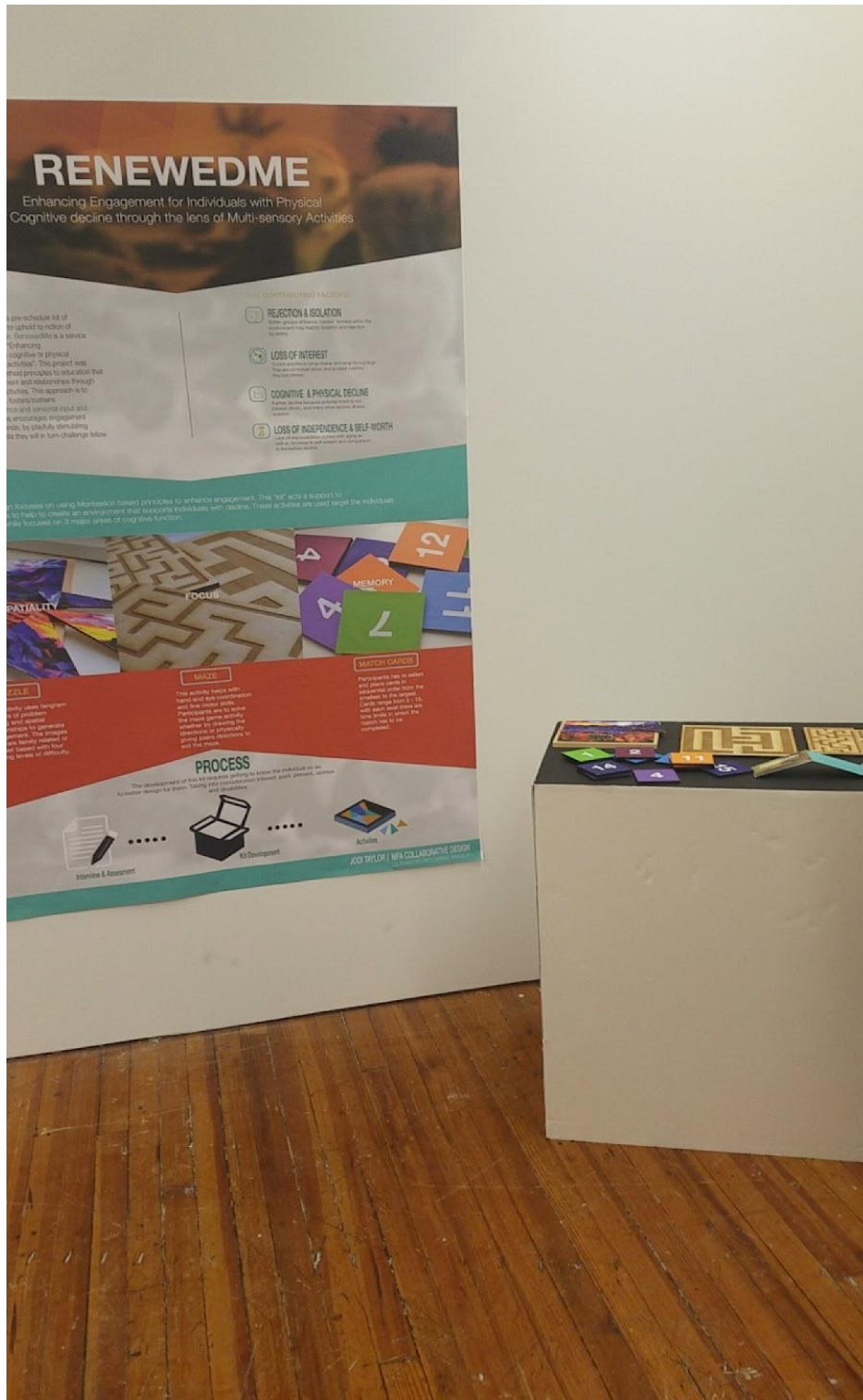


A:1.8. Bead counting activity used at Montessori schools with children ages 3-6.



A:1.9 Match Cards varied from easy, intermediate and hardest respectively.





Poster setup at Exhibition May 2016 in Smith Hall, Syracuse University

RENEWEDME

Enhancing Engagement for Individuals with Physical or Cognitive decline through the lens of Multi-sensory Activities

ABSTRACT

Traditional nursing homes have a pre-schedule list of activities for older to engage in. In light of notion of engagement, enjoyment and fun, RenewedMe is a service design project with the goal of "enhancing engagement in individuals with cognitive or physical decline through multi-sensory activities". This project was inspired by the Montessori Method principles to education that foster development, engagement and enjoyment through developmentally appropriate activities. This approach is to create an "environment" that encourages individuals, builds confidence and personal pride and output. The array of activities encourage engagement between caregivers and hands, by subtly stimulating cognitive and emotional skills they will encourage follow, residents and themselves.

THE CHALLENGE/PROBLEM STATEMENT

- 1. REJECTION & ISOLATION**
Higher percentages of "lonely" seniors suffer from an estimated one-third to one-half of their lives.
- 2. LOSS OF INTEREST**
Cognitive decline is not an inevitable part of aging. There are several ways to help improve the quality of life.
- 3. COGNITIVE & PHYSICAL DECLINE**
Cognitive decline encompasses memory loss, impaired attention and other skills, and is associated with the loss of independence and self-worth.
- 4. LOSS OF INDEPENDENCE & SELF-WORTH**
Loss of independence and self-worth is a common experience for many seniors.

DESIGN

This design focuses on using Montessori based principles to enhance engagement. The "kit" will be designed to caregivers to help to create an environment that supports individuals with decline. These activities are used target the individual's interest while focusing on 3 main areas of cognitive function.



PUZZLE

This activity uses tangram benefits of spatial thinking and visual mathematics to generate engagement. These pieces can be easily rotated or rearranged to solve varying levels of difficulty.

MAZE

This activity helps with hand and eye coordination and fine motor skills. Participants try to solve the maze using either a cotton swab or pencil tip to guide the way. The maze is designed to be challenging for physical and cognitive decline to solve the maze.

MATCH CARDS

Participants have to select and place cards to complete the board. Cards range from 1-15 with each level there are four levels to which the match has to be completed.

PROCESS

The development of this kit involves working to know the individual to be better design for them. Using user-centered research, prototyping, and iteration.



JOO TAYLOR | MFA COLLABORATIVE DESIGN

JOO TAYLOR

APPENDIX B

Cover Letter, Interview Questions And Assessment

Application for Research information permission to Daybreak, Loretto
Participation

Syracuse University | Collaborative Design Program

Objective: I am Jodi Taylor a student from Collaborative Design Program in Syracuse University. For my research of graduating thesis and design, I am seeking for permission to record interviews and interaction with these activities to better understand and analyze your interaction of the social process. Insights from the recording will aid in a clear view on how tactile based activities that could help you with your healthy life. Your input will help me to design ways to improve experience for both yourself and others.

Permission: I agree to allow Jodi to photograph the activity process. Photography can be stopped anytime.

I understand these images will not be used for any purpose other than the recorder's thesis and design research resource.

Participant:

Name (printed)

SIGNATURE

DATE

110 Smith Hall Syracuse, NY 13244-1180

e: jctaylor@syr.edu

Interview Guide

What are some of the common trends that lead to inactivity?

What do you think are the parallels between the aging mind and the mind of the child?

How do you receive feedback on your activities?

_____ Group Discussion _____ Survey _____ Individual group

How is engagement measured?

What is the common concern of most elders in nursing homes in regards to activities?

How do you ensure that the activities are age appropriate?

What is your understanding of activities being “childlike”?

Are the activities heavily individualized or group based?

Are the decisions or care plan a conversion had with adults?

What kinds of patterns do you see with the activities available?

If any, How are the individuals activities made?

Are the activities designed with the abilities of each individual in mind?

What makes the activities interdisciplinary, if any?

Interview Guide for Participants

How would you rate your ability to remember?

What is your favorite past time?

Is there anything any activity you like?

Interview Tips for Participants

Keep an open mind, asks few questions and take into consideration their body language. Remember, you are trying to understand the participant, so when you are not sure or they experience a level of difficulty with the activities, ask what happened?

Participant Activity Assessment

Name of Client: _____ Age: _____

_____ DOB: _____ Date: _____

Previous Occupation: _____ Education Experience: _____

_____ Present Interests: _____

Past Interest: _____

Type of Engager: Vocal _____ Physical _____ Visual _____ Auditory _____

Activity(s): _____

Play Duration: _____

Goals: _____

Cognitive Status

Experienced Difficulty: _____

Next Level: _____

Interacts with others: _____

Communication: _____

Motivated: _____

Memory: Short _____ Long _____

Physical Status

Limited Functions: _____

Adaptive Equipment: _____

Behavioral Status

Engaged: Yes ___ No _____

Agitated: _____

Solved Problems: _____

Initiate conversation about activity: _____

Disengaged after a period of time: Yes _____ No _____

Emotional Status

Happy _____

Agitated: _____

Sad: _____

Independent: _____

Bored: _____

Participants Reviews:

Caregiver Reviews

Goals met: _____

New Goals:

Activity Reviews: (Focuses on _____)

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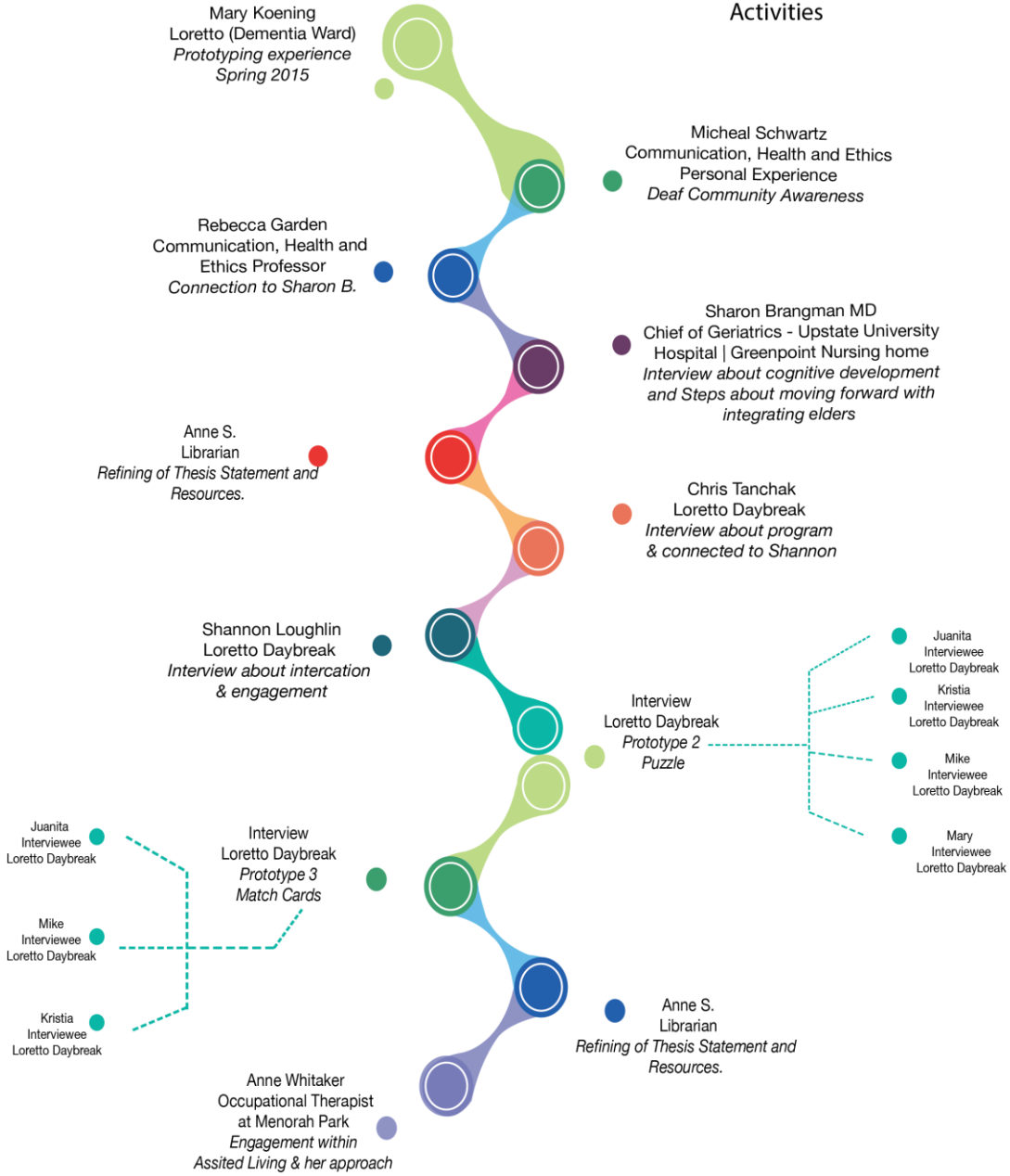
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Collaborative Process

Enhancing Engagement for Individuals with Physical Or Cognitive Decline through the use of Multisensory Activities



Jodi Taylor

Objective

I am adept to understanding and communicating the story that drives the design of products. I bring empathy and passion and commitment to my work. I hope to work in a stimulating environment that recognizes the value of user- centered design and utilizes an individual and collective skillsets to create unique solutions.

Experience

Instructional Assistant, Department of Design - Syracuse University [August 2014 – July 2016]

- Produce and edit content for the School of Design website
- Write articles on current student and faculty projects and Design News
- Establish and post on social media accounts for the School of Design
- Produce graphic and creative content for events

Research Intern - Catch 24 Advertising & Design [June 2015 – July 2015]

- Developed design briefs based on client requirements.
- Creative conceptualization of services and projects.
- Maintenance of social media outlets and building of campaigns.
- Research of marketing trends, competitors and customer behavior.

Senior Graphic Designer – Quest Security Services [2013]

- Team leader of the Graphic Design Department, also providing content and focusing heavily on the brand development

Education

Syracuse University- New York, USA [July 2014- 2016]

Collaborative Design, MFA

Edna Manley College of the Visual and Performing Arts – Kingston, Jamaica [August 2009 – 2013]

Visual Communications, BFA

Skills & Toolkit

UX/UI . Typography . Design Thinking . Project Management . Research Methodologies. Grid & Layout . Color Theory Graphic Design, Human Factors principles