

ARTICLE

Practical Experience with Age-related Dementia: Implementation and Outcomes of a Semester-long Service Learning Project in Neuropsychology

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Most neuroscience faculty share the common goal of maximizing student understanding of course material and increasing student excitement for the discipline. There is evidence that educational practices such as service learning, which is characterized by the fact that it both addresses a need in the community and meets key learning objectives in a course, can help accomplish these goals in an impactful way. This article describes the implementation of a service learning project at an assisted-living facility in an upper-level neuropsychology course. In addition, results of student self-evaluations indicate that

students self-report higher understanding of course content and skills associated with working with people with disabilities. Lastly, a discussion of some benefits of implementation is provided along with advice to others wishing to implement a similar service learning project. This advice will help ensure a positive experience for students in the course as well as for residents at the assisted-living facility.

Key words: age-related dementia; service learning; assisted-living; neuropsychology; alzheimer's disease

Fostering maximal student understanding and engagement with course material is a desirable goal for any instructor. The American Association of Colleges and Universities has identified several "high-impact educational practices" that have been shown to increase student engagement (Kuh, 2008). Many of these practices, such as collaborative, inquiry-based lab activities and undergraduate research, are commonly incorporated into neuroscience curricula. While research and laboratory experiences are certainly important, they can be financially costly and they do not fit easily with all courses. Other high-impact practices are not as common in the sciences. One such practice, known as service learning or community-based learning, provides students with an opportunity to apply what they are learning in the classroom to a community setting while at the same time providing a classroom forum for critical reflection and problem solving. Service learning is distinct from community service or volunteerism in that service learning not only addresses a need in the community but also addresses key learning objectives for a specific course and "is fully integrated into the course by means of reflective assignments, class discussion, or both" (Ozorak, 2003). Among its many benefits, service learning has been shown to foster student retention and engagement (Gallini and Moely, 2003) and several studies suggest that student learning of course material is enhanced through participation in service learning (Strage, 2000; Lundy, 2007). Furthermore, improvement of learning outcomes has been demonstrated for service learning over and above those seen for community service (Vogelgesang and Astin, 2000).

Service learning is a good fit for neuropsychology because, in my experience, many students who enroll in neuroscience and psychology courses aspire to work in applied clinical settings such as mental health, occupational or physical therapy, neuropsychology or general medicine. Despite this fact, other than internships,

there are few opportunities in the typical undergraduate curriculum that allow students to gain experience in clinical settings. Furthermore, for neuroscience instructors who are trained as experimentalists rather than as clinicians, it can be a challenge to provide students with opportunities that foster an understanding of the clinical aspects of the field of neuropsychology. The service learning project described below can be used to meet this challenge because it provides an opportunity to engage neuropsychology in an applied clinical setting. As such it can give students insight into the inherent ambiguity and challenge in researching, categorizing, and treating neuropsychological disorders, and it can foster a deeper appreciation of course material. In this paper I share my experiences implementing a service learning activity in an upper-level neuropsychology seminar course. My goal was to incorporate a "high-impact learning experience" which would help maximize student understanding of course content, allow students to gain clinical experience, improve their skills working with persons with disabilities, and increase general enthusiasm for neuroscience.

The College, the Course, and our Community Partner

Concordia College is a four-year co-educational liberal arts institution affiliated with the Evangelical Lutheran Church in America and the college enrolls approximately 2700 students each year. The Neuroscience program was established in 2007 and offers an academic minor. Approximately half of the students with declared neuroscience minors are psychology majors and the remaining half are biology or chemistry majors. Human Neuropsychology is a 300-level elective course which has an introductory neuroscience course and/or a junior-level standing as prerequisites. The course enrolls three main groups of students: neuroscience minors, psychology majors, and pre-health professions students.

Our non-profit, assisted-living community partner is

Eventide Senior Living Communities located in Moorhead, MN. It is in close proximity to the college and it “provides community-based living arrangements and individualized housing, service, and care options” (www.eventide.org). Eventide has had an established volunteer program within the local community and with Concordia College, for many years. Volunteers typically visit and converse with residents and sometimes help organize events, games, and music. The assisted-living center has a volunteer coordinator on staff and has an established training program, guidelines, and procedures for visitors.

MATERIALS AND METHODS

Implementation:

Concordia College has a Campus Service Commission which hosts yearly meetings with faculty to facilitate the incorporation of service learning projects into courses on campus. At this meeting I was informed of the existing “adopt-a-grand” program where college students can be paired with high-functioning residents at an assisted-living facility. In conversation with the facility’s staff, I inquired whether the adopt-a-grand program could be modified to include residents in the dementia unit. The facility was quite receptive to the idea because, according to the volunteer coordinator, the dementia residents typically get few visitors because the visits can be difficult for family members and volunteers are not typically assigned to these residents. After this initial contact, the volunteer coordinator and I had extensive conversations about our respective needs and objectives. This was crucial for ensuring that both students and residents experienced meaningful gains from the project because the existing program was a visitation program whereas I envisioned not only visitation, but also structured observation sessions. Drawing upon course readings, lecture and discussion, I wanted students to be able to suggest particular topics of conversation or suggest particular activities that would allow focused observation of how dementia affects the various mental and behavioral abilities discussed in our neuropsychology course. It was important to clarify this with the assisted-living staff and assure them that the students’ observational goals would never interfere with the comfort or best interests of the residents.

Once goals and expectations were established, we began the actual implementation of the project. During the third week of the course the class traveled to the assisted-living facility for an on-site orientation. Prior to the orientation students were given the HIPAA and criminal background check forms required by the assisted-living facility. The orientation itself included valuable information such as what to do in an emergency, what students are and are not allowed to do (e.g., no resident transfers, no administration of food or water without nurse approval, etc.), and the general policies and procedures of the facility. Following the orientation, students were each assigned a student partner. Each pair of students was assigned two residents: one with moderate to severe age-related dementia resident and one with mild to moderate age-related dementia. Residents were matched with students by the staff at the assisted-living facility. Once

students and residents were matched, students were instructed that they should visit one resident at a time and that their first few visits should be done with their student partner. I hoped this would allow students to get comfortable in the assisted-living setting and also serve to ease the discomfort of visiting a resident with moderate to severe dementia who may or may not be verbal. After the first 2-3 visits students were told that they could either continue visiting with their student partner or they could make their visits alone. This provision removed the difficulty of scheduling visitations according to their partner’s schedule as well as removing this potential excuse for failing to complete the required contact hours. Students were required to complete 20 hours of visitation over 12 weeks and were instructed to split their visitation time between their two residents. Ideally, students were to spend between 20-30 minutes with each resident on each 1-hour visit. However, many times the student would arrive to find out that one resident was sleeping, sick, at a doctor’s appointment, etc. and would thus spend 50-60 minutes with a single resident. Students completed these visits on their own outside of class time and their hours were recorded in a time sheet located on-site at the assisted-living facility’s volunteer desk.

There were five assignments related to course material for students to complete over the semester-long service learning experience. Each assignment was written in consultation with neuropsychology textbooks, National Institute on Aging information, Alzheimer’s Association materials, and primary sources (see online assignments at www.cord.edu/faculty/molson/SLAs.htm for full references; other supplemental materials mentioned in this article can also be found at this website). Additionally, the idea for an assignment on the emotional aspects of “sundowning” was suggested by the nursing staff at the assisted-living facility. I also made use of a service learning textbook which provided useful suggestions for how to integrate the service experience into the course in a meaningful way (Duncan and Kopperud, 2008). Each assignment coincided with our scheduled coverage of various topics in lecture and was designed with specific learning goals in mind (see Table 1 for a summary of assignments). A detailed outline of the topics covered in the lecture portion of the class, along with a breakdown of how the cumulative course grade was determined, can be found in the course syllabus located on the supplemental materials website. Service learning-related assignments were given to students at two-week intervals to allow for flexibility based on the needs of the student and resident. I found this to be an important consideration because, in terms of openness to interpersonal communication, residents frequently have “good days” and “bad days” and student assignments are meant to be as unobtrusive and stress-free for the residents as possible.

On the day each of the assignments was due in class, students spent 15-20 minutes in small group discussion sharing their observational results with each other. Additionally I encouraged them to also use these in-class discussions to share concerns, frustrations, tips and ideas with each other. Students have informally told me

Summary of Service Learning Assignments	
1) <i>Contemplation</i> - Prior to any visits students are asked to reflect on their excitement and apprehensions about the project. Next, after several meetings, students use the 7-stage model of Alzheimer's Disease to speculate as to the severity of their residents' stage of dementia <u>Major learning goals:</u> students recognize that there is seldom a "typical" case of Alzheimer's Disease and the lines between the stages are blurry. Signs and symptoms are often mixed with other medical and/or neurological diagnoses (stroke, etc.) This assignment is given after coverage of the course material on dementia.	
2) <i>Speech and Language</i> - Students take a conversation sample of 10 verbs from their resident and 10 verbs from a peer. Students compare resident word usage frequency to peer usage frequency and typically 70-90% of students report a difference in the predicted direction. <u>Major Learning goal:</u> Reinforce the neurobiological basis of behavior and mental function and demonstrate that neurodegeneration impacts behavior. This assignment is given after coverage of the course material on language and language disorders.	
3) <i>Memory</i> – Students make observations to find evidence for intact implicit memories despite dementia. Next students suggest conversation topics to their residents that allow students to informally assess resident's episodic, semantic, emotional features of a common public memory. <u>Major learning goal:</u> Recognize the multi-faceted nature of human memory through the observation that some memories are relatively spared while others are severely compromised. This assignment is given after coverage of course material on memory.	
4) <i>Emotion</i> - Students are directed to make several visits after the residents have taken their evening meal and look for evidence of increased confusion, anxiety, agitation and disorientation. Students must integrate their observations of "sundowning," defined as a period of increased agitation and confusion beginning at dusk, with recent research. <u>Major learning goal:</u> Observe a period of acute agitation and connect current theories that attempt to understand its physiological and neuroanatomical basis. This assignment is given after coverage of the topic of emotion.	
5) <i>Commitment</i> – Students reflect on the impact of the "service" and the "learning" on their resident and themselves. <u>Major learning goal:</u> Reflection on the "necessity of service and benefits to all involved" (Duncan and Kopperud, 2008).	

Table 1. Summaries of Service Learning Assignments. Copies of full assignments available at: www.cord.edu/faculty/molson/SLAs.htm.

that these sessions were very helpful to them both for understanding how course content applies to their residents and for dealing with the emotions of working with residents who have dementia.

Many additional assignments are possible. Factors to consider when making additional assignments include ensuring that the observational goals are as unobtrusive as possible and ensuring that the assignment is flexible enough so that all students are able to complete it given the needs and skills of their residents. Using the topic of memory as an example, an instructor's goal might be to have students observe how age-related dementia differentially impacts certain types of memory more than others. Tasks that explicitly test memory function, such as memory span tests, should be avoided in my opinion because they can place undue stress on the residents. When faced with a series of explicit questions to which they do not know the answer, residents can become agitated and defensive. Tasks which are less "test-like" and flexible, like having students suggest as a topic of conversation a common public memory (e.g., the assassination of John F. Kennedy) and noting the kinds of things recalled by the resident, can often meet the same learning goals but are less stressful to the residents.

Assessment of learning outcomes:

All procedures were reviewed and approved by the

Concordia College Institutional Review Board prior to administration. All surveys were constructed and administered online using the Student Assessment of their Learning Gains (SALG) instrument, which is free and can be found at www.salgsite.org. Administration of the instrument through the SALG website allows the researcher to monitor which students complete the instrument while still keeping individual responses anonymous.

Students (N=11-16 per semester) who enrolled in my 300-level neuropsychology course completed the semester-long service learning project described above as part of the course requirements. In order to assess learning outcomes, anonymous pre-participation and post-participation surveys were administered to students enrolled in the course during the spring semester of 2011 (N=16). This survey contained questions rated on a 5-point Likert scale as well as open-ended questions. The 5-point Likert scale was anchored with the label "not at all" on the low end and "a great deal" on the high end. These questions were grouped into three main categories: understanding, skills, and attitudes (see Table 2). The pre-participation survey was completed by 15 of the 16 students within the first three weeks of the semester prior to orientation at the assisted living facility. The post-participation survey was completed by all 16 students during the final week of the semester following completion

of all service learning hours and assignments. For the quantitative self-report data, t-tests were conducted to assess differences between pre- and post-participation scores. The data from the open-ended items on the post-participation surveys were categorized and are reported qualitatively.

Self-Rated Survey Questions
Understanding
Presently, I understand the following aspects of dementia that were explored in this class:
Behavioral, neuroanatomical, and neurochemical features of Alzheimer's Disease
The stages and progression of Alzheimer's disease
Treatment and care issues associated with dementia
How dementia can affect vocabulary and speech
The types of memories that are impaired, and the types of memories that are relatively spared in dementia patients
The specific emotional changes, confusion, and anxiety that accompany dementia
Skills
Presently I can:
Work effectively with people who have neurological disorders
Work effectively with people who have physical disabilities
Work effectively with people who have emotional disturbances
Attitudes
Presently I am:
Enthusiastic about Neuropsychology
Interested in taking or planning to take additional classes related to Neuropsychology
Interested in exploring career options in Neuropsychology

Table 2. Survey questions pertaining to understanding, skills, and attitudes administered on both the pretest and posttest.

Additionally, to get an indication of the long-term impact of the project on students, a survey was constructed and sent to former students who had completed the course either 2 (N=12) or 3 (N=11) years in the past. The response rate for former students, most of whom had already graduated from the institution, was 48% (N=11).

RESULTS AND DISCUSSION

The results of the pretest/posttest student self assessment indicated that the six survey items pertaining to student self-reported "understanding" of age-related dementia significantly increased $t=-8.89$, $p<.001$ (see Figure 1). Given the wording of the survey questions, it is not possible to determine the extent to which the observed increase is directly due to the service learning experience and the extent to which it is due to coverage of the material in lecture. To determine this, one would need to assess a

control group for comparison. Others have done this with different service learning projects and have found that students who participate in service learning perform better than students who do not participate in service learning on objective measurements (exam scores) as well as subjective self assessments (Strage, 2000; Lundy, 2007). In the present study, comparison of student exam scores and other objective measurements of understanding was not made due to the anonymous nature of the study. Despite the ambiguity with the current data, it is clear that there are significant self-rated improvements in understanding of course content with the combined effects of lecture and service learning.

The three survey items pertaining to "skills" associated with working with individuals with disabilities also significantly increased $t=-2.87$, $p<.01$. Given that these skills were not covered in lecture, but rather only in the context of the service learning project, this self-rated increase is likely due directly to the service learning experience. Again, this points to the usefulness of the service learning project for students who desire a career in an applied clinical field as well as for general life skills working with special populations. Finally, the three survey items relating to general "attitudes" toward neuropsychology were unchanged $t=-.63$, $p>.05$. This may indicate the service learning experience does little to foster enthusiasm for the discipline. Conversely, because the course is an elective that is required neither for our neuroscience minor nor for our psychology major, it could also be that junior- and senior-level students who enrolled in the course already had high baseline interest and enthusiasm for the discipline.

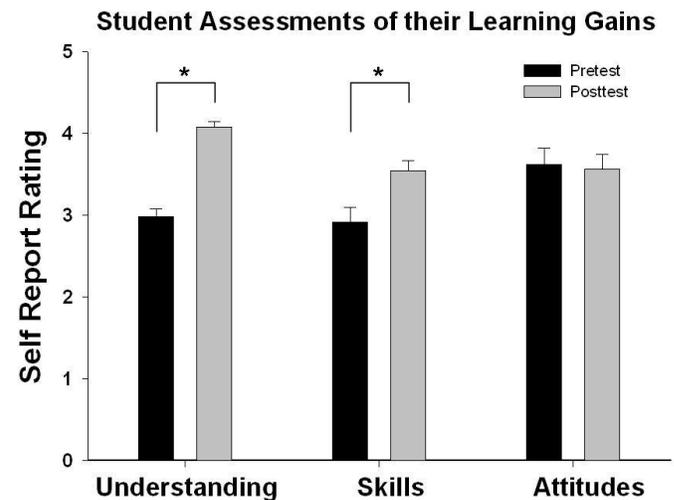


Figure 1. Students' self-reported ratings at pretest (dark bars) and posttest (light bars) for understanding, skills, and attitudes on a 5-point scale. Understanding of course content related to dementia and skills for working with individuals who have dementia-related disabilities significantly increased. Figure made using SigmaPlot 2000 (Point Richmond, CA).

In attempting to categorize the open-ended survey items, I grouped each of the answers into general themes. For the question "Please comment on how the service learning project at [the assisted living facility] rated as an

impactful experience in your college education" 12 out of 16 students responded. Of these 12 students, some of whom made comments falling into more than one category, six indicated that the service learning experience was one of the top experiences they have had in their college careers, five indicated appreciation of the opportunity to apply course content to a real-world setting, six remarked favorably on the chance to work with people who were in need, and two mentioned disliking the amount of contact hours required for the service learning experience. A representative comment was "**Working at [the assisted living facility] was a top 5 experience in terms of impact upon my development at [the] College. Not only was I able to learn more about dementia, but I also learned about how to stretch my comfort zone and see life through a different perspective. The experience as a whole was very meaningful and educational about a neurological disease and about myself as an individual.**"

The second open-ended question was "As you look ahead, what do you expect to CARRY WITH YOU from the service learning project at [the assisted living facility] into other classes or other aspects of your life?" Of the 10 people who chose to respond, seven indicated that they expected to carry with them a respect and understanding for people with dementia and two indicated that they expected to carry little with them from this experience. One comment that was representative of the majority was "**From the service project, I have gained a better ability to relate to people who have dementia or other medical/mental/behavioral problems, to sympathize with them and their families, and think of ways how to make their lives a little better. It has made me better able to empathize with others and "see the big picture" in life.**"

The final open-ended question was "How much did the service learning project at [the assisted living facility] help your learning?" Of the 12 students who chose to respond, 10 made comments indicating that the service learning significantly impacted their learning, whereas two students indicated that the service learning did not significantly impact their learning in the course. A representative comment was "**It was very beneficial [learning] about not only dementia but also about the care that individuals with neurological disorders may need. Also it showed the way that changes to the brain can drastically affect an individual's way of life.**" Additionally, 11 out of 12 students who responded to the open-ended questions indicated that they plan to put the assisted-living experience on their resume and/or graduate school applications.

Based on the open-ended questions overall, 2 students appeared to have a neutral or negative experience with the service-learning project, whereas 10 indicated a largely positive experience. Unfortunately, other than the indication that the number of required hours was deemed unreasonable, the comments from these two students were very brief, so I am unable to speculate why their experience was not positive. It would be interesting to determine how many contact hours these two students

completed and whether these two students were partners with each other, but due to the anonymous nature of the survey this was not possible.

In addition to my assessment of current students, similarly worded questions were posed to all 23 former students who had taken the course two or three years ago. Of the 23 survey requests sent, 11 were completed. Clearly this could be a self-selecting group, but their data could serve as a preliminary indication of some of the long-term impacts of the service learning project described above. Self-report survey questions were not identical to the questions asked to current students, but two questions were designed to assess "understanding" and "attitudes." When asked "To what extent did the service learning project at [the assisted living facility] provide gains for your understanding of age-related dementia?", former students gave an average rating of 4.9 with a standard deviation of 0.3 on the 5-point Likert scale. Similarly, when asked "As a result of your work in this class, what GAINS DID YOU MAKE in your enthusiasm for neuroscience" students gave an average rating of 4.8 with a standard deviation of 0.4. These results seem to indicate that retrospective assessment of the impacts of the experience on understanding and attitudes was quite high.

With regard to open-ended questions, when asked "Please comment on how the service learning project at [the assisted living facility] rated as an impactful experience in your college education," former students gave similar responses to the current students with five mentioning that the project enhanced their understanding of course content, three remarking on their appreciation of the opportunity to work in a "real" setting, two mentioning self understanding and one student mentioning that the number of required contact hours was too high. In addition, five of the 11 respondents indicated that the service learning experience was one of the most impactful experiences of their undergraduate education. Two example comments were "**This project really taught me the value of clinical neuroscience and how to apply textbook knowledge to real life situations,**" and "**The greatest thing it did was help learn how to deal with clinical populations and learn first hand the different effects of dementia.**" When asked "As you look back, what did you CARRY WITH YOU from the service learning project at [the assisted living facility] into other classes or other aspects of your life?", six respondents indicated that the experience gave them a greater empathy for those with mental illness or brain injury, and four respondents mentioned that the experience was valuable preparation for their current job and/or graduate school training. "**While working as a CNA [Certified Nursing Assistant] after the course, I was able to be more empathetic towards individuals with dementia.**" And "**Now, my time (even if a short amount) provided me with communication tools and experiences that I would not have otherwise. I think it also provided me with a chance to step outside of my comfort zone, which today is helpful.**" Furthermore, six of the 11 respondents indicated that they have put the service-learning experience on their resume and/or graduate school application and one person reported

referencing stories from their service learning experience during job interviews.

Finally, while certainly not the norm, one last comment is indicative of the type of impact this project can have on a student. ***“The service learning project was certainly the most impactful experience of my college education. Being given the opportunity to take my education out of the classroom, with the intention of improving the quality of life of [the] residents, was an experience I will always appreciate and will never forget. My understanding of the course material felt “real” after interacting with the residents of [the assisted living facility]. And, more than anything else, the service learning project fueled my desire to help others, a desire I take with me to graduate school in the fall.”***

Benefits of implementation

Given the current state of affairs in academia, faculty at many institutions are being asked to provide more high-impact learning experiences that foster student engagement and retention with the same, or less institutional financial support. Depending on the topic of study, implementation of some high-impact learning experiences, such as inquiry-based labs and faculty-directed research, can be cost- and time-prohibitive, especially for small or recently added neuroscience departments and programs. This article describes a high-impact learning experience that connects neuropsychology course content with extracurricular community involvement and involves little to no monetary cost.

The service learning project described in this article is easily adoptable throughout the United States. According to the Alzheimer’s Association, Alzheimer’s Disease impacts 13% of people over the age of 65 and roughly 43% of people over the age of 80 (www.alz.org). With increasing numbers of Americans entering these age brackets, there is mounting pressure on the nation’s assisted-living facilities to care for those with age-related dementia. This, coupled with the fact that there are over 36,000 assisted living facilities in the United States, is evidence that there is both the need and the opportunity to incorporate similar service learning experiences into neuroscience courses at other institutions. In addition to neuropsychology, similar service-learning experiences could be envisioned for other courses in neuroscience such as cognitive neuroscience, sensation and perception, and speech and language. According to the volunteer coordinator at the assisted-living facility that I work with, volunteerism performs a vital service at assisted-living facilities, and most facilities have well-established volunteer programs. Therefore, faculty wishing to adopt a service learning experience similar to the one described above will likely find many logistical details have already been addressed by their assisted-living community partner. Despite this, fewer assisted-living facilities may have had experience working with students in college courses, and they may need to be assured that the student class assignments are not invasive or physically or emotionally taxing for the residents. Additionally, the assisted-living facilities may not typically assign volunteers to work with

residents with late-stage dementia. As mentioned previously, these issues will need to be discussed with the facility’s volunteer coordinator, and clear communication regarding the needs of the students and the needs of the residents should take place prior to the start of the service learning relationship.

Tips for successful service learning implementation

From the faculty perspective, there is a certain level of risk associated with incorporating projects such as this into one’s course. To be a meaningful experience for all involved, a substantial amount of contact hours are desirable. Given this time commitment, the project should also be a significant portion of the course requirements. In my course, the contact hours and related assignments are worth 15% of the course grade. It can be uncomfortable to place such a large portion of the course outside of the instructor’s direct control. As previously mentioned, providing the students with multiple in-class opportunities for reflection and for airing concerns with peers and with the course instructor can help alleviate many potentially problematic issues. There are many excellent general service learning resources which provide basic information and advice for service learning implementation. However, despite any amount of preparation, there are inevitable aspects of the specific type of service learning described in this paper that can lead to difficulty for certain students. Occasionally, residents pass away over the course of the semester and this can be difficult for some students. Additionally, some students have grandparents who have been diagnosed with an age-related dementia, and again, they may find it emotionally difficult to witness the effects of late-stage dementia. I have found it helpful to tell students about these concerns up-front and provide them with ample opportunities for reflection and discussion with other students.

Some of the benefits this service learning project provides to the students have been described above, but the experience also provides benefits for the assisted-living facility and the residents. Perhaps the primary benefit to the assisted-living facility is the one-on-one attention that students are able to give to their residents, a role that is impossible for the assisted-living staff given the demands of their jobs. In addition, assisted-living residents with dementia have certain characteristics that make it difficult for most typical volunteers to provide visitation companionship. Neuroscience students who understand the symptoms of dementia are a better fit for working with dementia residents, and family members may be comforted to know that their loved one is being visited. Overall, I have found my supervision of this project to be one of the most rewarding experiences of my career. It seems clear from informal conversations and the data I have presented above that the assisted-living facility staff and the majority of students feel similarly. I hope others will adopt this project and gain as much from it as we have.

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