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### An Innovative Home-Based Interdisciplinary Service- Learning Experience

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# An Innovative Home-Based Interdisciplinary Service-Learning Experience

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**ABSTRACT.** The University of North Carolina Mobile Student Health Action Coalition (UNC MSHAC) at Chapel Hill, North Carolina is a voluntary service-learning program in which interdisciplinary teams of

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graduate level health professional students provide monthly home visits to isolated, community-dwelling elders with complex medical and social issues. Students are mentored by UNC clinical faculty and retirees from the local community. Together, mentors and students generate action plans to improve the health and well-being of the participating elders. We report here the qualitative and quantitative results from our program evaluation demonstrating UNC MSHAC as an effective, service-learning model that compliments curricula, is satisfactory to students, and is a vehicle for academic institutions to serve elders in the local community. doi:10.1300/J021v28n03\_07 [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2008 by The Haworth Press. All rights reserved.]

**KEYWORDS.** Student attitudes, geriatrics, service-learning, interdisciplinary, home visits

## INTRODUCTION

The number of people over the age of 65 in the United States is expected to double in the next 25 years. Currently, approximately 30% of home-dwelling older adults live alone. Over 16% of those 65 and older live at or near the poverty level, and the majority of older adults have a least one chronic condition (Administration on Aging, 2006). The challenges of caring for such a vulnerable population have been outlined by national organizations such as the American Geriatrics Society, the Institute of Medicine, and the Pew Health Commission (The Education Committee, 2000; Institute of Medicine, 2003; O'Neil & Pew Health Professions Commission, 1998). Core competencies that will be needed by clinicians caring for older adults include: disease prevention, health promotion, involvement of the patient and family in care decisions, interdisciplinary teamwork, comprehensive geriatric assessments, and caring for the community's health (Institute of Medicine, 2003; O'Neil & Pew Health Professions Commission, 1998; Seifer, 1998; The Education Committee, 2000). While the importance of these core competencies has gained acceptance, many of the concepts are difficult to teach within the constructs of traditional, educational methods.

A promising solution to integrating these core competencies into health professional schools' graduate curricula may be found in the theory of service-learning. Service-learning affords students an opportunity to broaden their understanding of health and quality of life and to discover

the connection between service to the local community and academic coursework (Community Campus Partnerships for Health, 2007; Seifer, 1998). Additionally, through guided reflection techniques, service-learning can help students learn professional development skills, interdisciplinary teamwork skills, and community diagnosis skills (Dornan & Bundy, 2004; Littlewood et al., 2005; Seifer, 1998).

Many health professional schools have successfully implemented service-learning programs that have resulted in meaningful educational effects and benefits to the communities that are served (Burrows, Chauvin, Lazarus, & Chehardy, 1999; Davidson & Waddell, 2005; Hayward, Kochniuk, Powell, & Peterson, 2005; Knapp & Stubblefield, 2000; Sternas, O'Hare, Lehman, & Milligan, 1999; Mareck, Uden, Larson, Shepard, & Reinert, 2004; Young, Bates, Wolff, & Maurana, 2002). The Interdisciplinary Family Health (IFH) course at the University of Florida Health Science Center exemplifies the value of a successful service-learning program. In 2001, IFH included over 400 beginning health professional students, who were required to visit families in their homes and to establish wellness care plans. Over 80% of the students reported that the experience enhanced their professional education and increased their awareness of barriers to health promotion and wellness (Davidson & Waddell, 2005).

In this paper, we describe UNC MSHAC, a voluntary service-learning program, and provide our evaluation findings on program effectiveness. UNC MSHAC is a unique service-learning opportunity in that it combines interdisciplinary teamwork opportunities for students and home-based service to medically complex elderly individuals in one programmatic experience. Thus, UNC MSHAC may provide academic institutions with an innovative way to influence students' attitudes toward older adults, meet core competencies, and serve the needs of their communities.

## ***UNC MSHAC PROGRAM DESCRIPTION***

### ***Background and Goals***

In 2000, the University of North Carolina School of Medicine at Chapel Hill's medical students founded UNC MSHAC as a way to extend the university's existing free clinic services to isolated, elderly individuals in the community. Six years later, UNC MSHAC continues to

be run by volunteer, interdisciplinary, health professional students and faculty and serves approximately 20 elderly patients each year. The goals of UNC MSHAC are to (McWilliams, 2006):

- Support the development of relationships between students and older adults.
- Teach health professional students, who are early in their training, to practice collaboratively with other disciplines in the care of patients.
- Foster health professional students' appreciation of a person's community, family, and home as a context for healthcare decisions.
- Improve the health and well-being of community-dwelling, isolated, elderly individuals who have complex social and medical issues.

### *Participants*

Each academic year, nine students from multiple healthcare disciplines volunteer to assume leadership roles for the program. These students are responsible for ensuring smooth program operation. A faculty advisor provides guidance and institutional memory for each year's student leaders. Over 100 student participants volunteer from seven healthcare disciplines: Medicine, Nursing, Occupational Therapy, Pharmacy, Physical Therapy, Public Health, and Social Work. The precise number of students from each discipline is variable due to yearly fluctuations in class sizes and student interest.

Students are placed onto interdisciplinary teams of four to five students, and each team is assigned to an elderly patient. The teams are required to make monthly home visits to their patients for the entire academic year. The patients served by UNC MSHAC are referred to the program by UNC providers from the Divisions of General Medicine and Geriatric Medicine in the Department of Internal Medicine and the Department of Family Medicine. The patients typically have complex medical and social needs and are difficult to care for in a traditional medical setting. Referring providers stay in regular contact with the teams that visit their patients. Additionally, in both formal and informal sessions throughout the year, seven clinical faculty with expertise in geriatrics and 19 residents of a local retirement community mentor the student teams and help them reflect on their experiences.

### ***Program Activities***

*Home Visits.* At the beginning of the academic year, all of the student participants attend a formal training session. Through a variety of didactic sessions and small group meetings, the students are introduced to the goals of the program, other disciplines, and the basic tenets of geriatric medicine. Prior to their first home visits, the teams consult with the referring providers to identify specific concerns and expectations for the visits. For example, a provider may ask students to help a patient better control his diabetes through education about diet, exercise, and medication management.

Throughout the year, teams develop rich relationships with the patients. As these relationships evolve, the home setting uniquely positions students to identify issues, such as barriers to care and safety hazards that are not readily transparent or easily fixed in a clinic visit. The teams are challenged to identify, along with the patients and their providers, one or two patient needs that will become the focus for their energies during the year. In general, teams focus on patient needs that can be addressed in one of the following four ways (McWilliams, 2006):

1. Connecting patients to appropriate community resources.
2. Educating patients about health promotion, disease prevention, nutrition, and medications.
3. Bridging communication gaps between patients and providers or among a patient's various providers.
4. Working on clearly defined service projects such as home safety improvements.

Student teams visit their UNC MSHAC patients monthly for an entire academic year, which allows for longitudinal follow-up with patients and the opportunities to witness the results of action plans that are implemented.

*Precepting.* Throughout the year, student teams receive mentoring and guidance from a dedicated group of volunteer preceptors consisting of clinical faculty and members of a local retirement community. The clinical faculty volunteers are trained in gerontology/geriatrics and come from the various disciplines represented in the program. Unless the student team members specifically request it, preceptors do not attend home visits with the teams. Instead, the preceptors have face-to-face meetings with the teams at least once each semester. Two faculty members, two

retirement community members, and one team attend each session, which typically lasts one hour.

At the preceptor meetings, each team presents its UNC MSHAC patient to the preceptors. The preceptors then guide the teams in the process of identifying needs and creating action plans for the UNC MSHAC patients. Additionally, the preceptors ensure that each team is acting within their legal scope of practice. The retirement community members further enrich the precepting experience by sharing their personal insights into the aging process and oftentimes assist with service projects such as home repairs and the installation of fall prevention devices.

### ***Program Dissemination***

To support the forecasted growth and dissemination of UNC MSHAC, the authors created an operations manual, "Beyond Clinic Walls" (McWilliams, 2006), with funding from the UNC Center for Aging and Health, UNC Division of Geriatric Medicine, the Donald W. Reynolds Foundation, and The Elizabeth T. and William N. Hubbard, Jr. Memorial Fund. "Beyond Clinic Walls" provides detailed information needed to replicate the program. Hardcopies are available upon request or through our website, <http://www.med.unc.edu/aging/bcw>.

## ***EVALUATION AND METHODOLOGY***

A two-tiered program evaluation was designed that focused on the program's implementation (two open-ended questions) and educational outcomes. Educational outcomes were assessed with five attribution questions and one satisfaction question developed by the authors. Additionally, the University of California at Los Angeles Geriatric Attitude Scale (UCLA Scale) comprised the attitudinal questions. The UCLA Scale's 14 attitudinal questions were administered in a pre-post test design with the remaining questions incorporated into the post-test.

### ***Implementation Evaluation***

We assessed the strengths and weaknesses of UNC MSHAC by asking students to answer two open-ended prompts: (1) please describe your favorite experience with UNC MSHAC; and (2) please list one or



two suggestions describing how we can improve UNC MSHAC. The information obtained was used by program leaders to facilitate program improvement and is also reported here to aid in program dissemination.

### ***Educational Outcomes Evaluation***

*Attribution.* Based on the core competencies laid out by national organizations, UNC MSHAC's goals, and the program's activities (discussed previously), we identified five areas in which UNC MSHAC student participants were expected to develop competencies (The Education Committee, 2000; Institute of Medicine, 2003; O'Neil & Pew Health Professions Commission, 1998). A newly designed questionnaire (consisting of the five attribution questions) utilizing a 5-point Likert agreement scale (1 = strongly disagree, 5 = strongly agree) was administered to determine whether student participants would attribute improvements in these five core areas to their UNC MSHAC experience.

*Satisfaction.* On the questionnaire, we also assessed student participants' overall satisfaction with UNC MSHAC by asking, would you [the participant] recommend UNC MSHAC as an experience to another student (yes or no)?

*Attitudinal.* The 14-item UCLA Scale with a 5-point Likert agreement scale (1 = strongly disagree, 5 = strongly agree) was used to evaluate if students' attitudes toward older adults changed after participating in UNC MSHAC (Reuben et al., 1998).

### ***Evaluation Respondents***

In the 2005-2006 academic school year, 124 students from seven different healthcare disciplines participated in UNC MSHAC. All 124 students were recruited to participate in the evaluation. Eighty-four students (67.7%) consented to participate. Three student surveys were discarded due to incomplete data, leaving 81 students (65.3%) who completed the surveys and contributed data to the analysis. Of these 81 students, 28 completed both the pre- and post-test (hereafter referred to as the "matched group"). The remaining 53 students only completed one survey; 34 took only the pretest and 19 took only the post-test—hereafter referred to as the "pretest only" and "post-test only" groups, respectively (see Table 1 for group characteristics).

TABLE 1. Characteristics of the Matched Group, Pretest Only Group, Post-Test Only Group, and All Participants

Characteristic	Matched Group n = 28 % (Freq.)	Pretest Group n = 34 % (Freq.)	Post-Test Group n = 19 % (Freq.)	All Participants n = 81 % (Freq.)
School of Medicine: MD program	10.7 (3)	26.5 (9)	5.3 (1)	16.1 (13)
School of Medicine: PT program	10.7 (3)	14.7 (5)	10.5 (2)	12.4 (10)
School of Medicine: OT program	10.7 (3)	8.8 (3)	10.5 (2)	9.9 (8)
School of Nursing	7.1 (2)	8.8 (3)	31.6 (6)	13.6 (11)
School of Pharmacy	32.1 (9)	20.6 (7)	21.1 (4)	24.7 (20)
School of Social Work	14.3 (4)	11.8 (4)	10.5 (2)	12.4 (10)
School of Public Health	14.3 (4)	8.8 (3)	10.5 (2)	11.1 (9)
1st Year of School	64.3 (18)	44.1 (15)	57.9 (11)	54.3 (44)
2nd Year of School	21.4 (6)	50.0 (17)	26.3 (5)	34.6 (28)
3rd Year of School	10.7 (3)	5.9 (2)	15.8 (3)	9.9 (8)
4th Year of School	3.6 (1)	0 (0)	0 (0)	1.2 (1)
Male	3.6 (1)	20.6 (7)	0 (0)	9.9 (9)
Female	96.4 (27)	79.4 (27)	100 (19)	90.1 (73)

Note: Results reported as percentages and frequencies.

Statistical Methods

Univariate statistics were used to calculate descriptive characteristics for the three groups of respondents, the percentage agreement for the five competencies, and the percentage of students satisfied with the program. To facilitate the reporting of results for the competencies, we collapsed the answers “somewhat agree” and “strongly agree” into a combined “agreement” category. The authors examined responses to open-ended questions and determined which themes emerged for all students who completed the post-test (n = 47).

At the time of this evaluation, the UCLA scale was reported to be a validated instrument for measuring attitudes toward older people and caring for older patients. Higher composite scores reflect more positive

attitudes. Internal consistency reliability and cross validation were previously reported as 0.76 and 0.75, respectively. Of the fourteen questions on the UCLA Scale, nine are negatively worded and five are positively worded (Reuben et al., 1998). To produce a total score, each participant's ( $n = 81$ ) scores on the negatively worded statements were reversed and added to the scores on the positively worded statements. Individual UCLA Scale means were calculated and used to determine the group pre-test and post-test means.

To ensure the statistically analyzed group represented the entire cohort of evaluation participants, student  $t$  tests compared the mean scores of the matched group with the pretest only and the post-test only groups. Finally, a paired  $t$  test assessed the presence of a significant difference between the pretest and post-test mean scores for the matched group ( $n = 28$ ). Effect size difference was measured using the Coefficient of Determination,  $r^2$ , and Cohen's  $d$ . Cronbach's alpha measures were used to determine how well the 14 items on the UCLA Scale measured a single unidimensional latent construct. Two-tailed tests were used with a  $p$ -value of  $< 0.05$  considered significant. The entire evaluation was approved by the UNC Institutional Review Board.

## RESULTS

### *Implementation Evaluation*

*Strengths.* When we examined the students' responses describing their favorite experiences with UNC MSHAC, a number of themes arose: (1) students enjoyed the rich experiences surrounding the interactions that they had with the older adult patients; (2) students appreciated the changes that they witnessed in the patients over the course of the year; and (3) students valued their interactions with students from other disciplines. The following are excerpts from student comments depicting each of these program strengths:

1. "I really enjoy our [UNC MSHAC patient's] company. She is absolutely hilarious and has a great sardonic wit. I remember the night we brought her dinner . . . she felt special that night, and it was the first visit where we heard her say 'I'm so happy!' "

2. "I enjoyed watching the change in our patient . . . he was hesitant at first to have us come out and offer help . . . now he is more comfortable with us and is letting us help him more and more."
3. "UNC MSHAC has taught me a lot more about working with other disciplines . . . you need a team a lot more than I ever would've guessed."

### ***Weaknesses***

Students were also asked to give suggestions of how UNC MSHAC could be improved. Three themes emerged from these responses: (1) to improve the program's efficiency at the beginning of the year; (2) to improve the match between the promised and the actual program experiences for students; and (3) to foster more idea sharing amongst students through additional group gatherings. The following are student comments depicting each of these program weaknesses:

1. "[We needed] better and more comprehensive handouts given during orientation such as, things to do during your first visit, ideas for projects, clearer instructions for how to write notes . . . also make sure every team has a patient in the beginning."
2. "Patient selection could be improved . . . while I felt like our visits were important and meaningful for our patient; I felt more like a friendly visitor. I [got] a sense from recruitment that we would be providing more services for our clients, or more likely connecting them to other services in the community that might be beneficial for them. I would thus suggest that [patient] recruitment efforts [be] a little more focused."
3. "It would be great to meet with the other groups to hear what they are doing to help their patients and to learn how they tackle tough issues. I recommend a large group meeting at least once per semester."

### ***Educational Outcomes Evaluation***

Among the participants in the matched group ( $n = 28$ ), a majority consensus was obtained in each of the five areas tested (see Table 2). Participants agreed that UNC MSHAC was associated with improvements in the following areas: ability to develop self-confidence working with older adults (89.3% agree); knowledge of other disciplines (89.3%

TABLE 2. Matched Group Responses on UNC MSHAC Competencies

Question: My experience with UNC MSHAC increased my . . . (n = 28)	Somewhat Agree % (Freq.)	Strongly Agree % (Freq.)	Total Agree % (Freq.)
. . . understanding of the contributions that other health care disciplines make to an interdisciplinary team	32.1 (9)	57.1 (16)	89.3 (25)
. . . ability to work effectively on an interdisciplinary team	42.9 (12)	39.3 (11)	82.1 (23)
. . . appreciation of the need to include a patient's community, family, and home as a factor in health care decisions	25.0 (7)	64.3 (18)	89.3 (25)
. . . comfort level in obtaining appropriate community resources for patients	60.7 (17)	21.4 (6)	82.1 (23)
. . . comfort level working with older adults	46.4 (13)	42.9 (12)	89.3 (25)

Note: (Likert Scale: 1 Strongly Disagree . . . 5 Strongly Agree). The "Somewhat Agree" and "Strongly Agree" Categories were collapsed into the 3rd category of "Total Agree" to facilitate reporting. Results reported as percentages and frequencies.

agree); ability to work as an interdisciplinary team member (82.1% agree); ability to understand and incorporate a patient's community, family, and home as a context for healthcare decisions (89.3% agree); and ability to appropriately use community resources (82.1% agree). When asked if they would recommend the program to other students, 96.4% of students answered yes.

The Cronbach alphas for the pretest and post-test UCLA Scale were 0.768 and 0.555, respectively. A paired *t* test comparing the difference of the pretest and post-test scores for the matched group demonstrated a statistically significant increase of 0.122 ( $p = 0.034$ ) in the mean UCLA scores (see Table 3). This increase is indicative of an improvement in the participants' attitudes toward older adults (Reuben et al., 1998). The Coefficient of Determination and Cohen's *d* were 0.588 and 0.286, respectively suggesting a large effect size. The mean pretest and post-test scores of the matched group were not significantly different ( $p = 0.817$  and 0.998, respectively) from the mean scores in the pretest only or post-test only groups, indicating that the analysis of our matched group was

TABLE 3. UCLA Geriatric Attitude Test Score Comparison

Group	Pretest Mean (SEM)*	Post-Test Mean (SEM)*	Paired t-Test Mean Difference (SEM)*	p-Value	Coefficient of Determination $r^2$	Cohen's $d$
Matched group (n = 28)	3.86 (0.084)	3.98 (0.074)	0.122 (0.055)	0.034	0.588	0.286
Pretest only group (n = 34)	3.84 (0.063)	—	—	—	—	—
Post-test only group (n = 19)	—	3.98 (0.072)	—	—	—	—

\*SEM represents standard error of the mean.

likely an accurate representation of all the evaluation participants (see Table 3).

DISCUSSION

Our program evaluation indicates that UNC MSHAC is an effective service-learning program and is satisfactory to a majority of students. The program’s richness is perhaps best captured in the students’ open-ended responses. These comments suggest that students particularly valued their interactions with the older adults, the ability to follow a patient’s changes over the course of a year, and the hands-on experience of working on an interdisciplinary team. Of note, these program strengths stand out as experiences that are both difficult to teach and ones that the students would be unlikely to encounter within their standard health professional curricula—thus further corroborating the strengths and benefits of service-learning.

Our educational evaluation also shows the program resulted in an increase in participants’ comfort levels and abilities to work with older adults. Additionally, based on pretest and post-test UCLA Scale scores, participants’ attitudes toward older adults showed a significant improvement. While the absolute increase in mean scores may seem small, our analysis of effect size suggests a large effect. Furthermore, Kishimoto, Nagoshi, Williams, Masaki, and Blanchette (2005) reported a correlation between decreasing UCLA Scale mean scores and additional years

of medical school training (Kishimoto et al., 2005). Consequently, when evaluating students advancing in their training, improvements of any magnitude in attitudes toward older adults should be viewed as important.

We have taken a number of steps to address the weaknesses identified through the evaluation. In order to address the lack of efficiency at the year's beginning, the formal training session now includes more explicit handouts that detail examples of program activities, home visits, and past project ideas. In addition, we also ensure that each team receives a patient assignment no later than at the training session. To remedy the mismatch between students' expectations and the reality of the experience, our volunteer recruitment efforts now emphasize the unique needs of each patient and that the experience may or may not involve hands-on practice of traditional clinical skills. Additionally, in an attempt to recruit a patient population with more uniform needs, we have laid out more explicit guidelines for patient referrals. Finally, to create a new forum for students to share ideas and concerns, we plan to create a second, large group meeting that would occur at the end of the first semester.

Our evaluation has several limitations. Because our analysis was performed on only a subset of participants, the matched group, it is possible that non-random differences existed within this group that confounded our results. However, we feel that such confounders are unlikely to have affected our analyses because we compared the UCLA Scale scores of the matched group and the single test-taker groups and found no significant differences. The similarity of the scores between the groups suggests that our results would likely have been consistent with pre-test and post-test data on the entire cohort of students participating in the evaluation.

Because our preliminary evaluation was non-randomized and lacked a control group, we cannot determine conclusively if UNC MSHAC was entirely responsible for the changes we have described. UNC MSHAC is an extracurricular experience that occurs simultaneously with existing curricula and other experiences that may expose students to older adults. However, the UNC MSHAC experience likely plays a significant role in attitude changes because students overwhelmingly responded in agreement when asked if their experience with UNC MSHAC contributed to an increase in self-confidence when working with older adults. In addition, our findings are similar to results of previously reported studies that demonstrated improved attitudes toward older adults after the implementation of interventions exposing students to elders

(Alford, Miles, Palmer, & Espino, 2001; Bernard, McAuley, Belzer, & Neal, 2003; Corwin et al., 2006; Eleazer, Wieland, Roberts, Richeson, & Thornhill, 2006; Knapp & Stubblefield, 2000; Reuben et al., 1998).

Finally, at the time this evaluation was conducted, the UCLA Scale was considered the gold standard for assessing changes in students' attitudes toward older adults. The validity of the scale has since been questioned (Stewart, Roberts, Eleazer, Boland, & Wieland, 2006). In addition, the UCLA Scale was designed and validated to measure primary care residents' attitudes but was used here to measure the attitudes of students from seven healthcare disciplines. However, previous research has demonstrated that the UCLA Scale is appropriate for use across the continuum of medical training. Furthermore, the attitudes scores we have reported are consistent with medical student scores reported elsewhere (Kishimoto et al., 2005).

These limitations suggest the need for the field of gerontology to develop more accurate tools to measure attitude, knowledge, and skill changes related to geriatric educational interventions across a wide range of healthcare disciplines. Also, rigorously designed, longitudinal studies are needed to examine the actual effectiveness of UNC MSHAC and other service-learning experiences.

## CONCLUSION

As the numbers of frail older adults with multiple medical problems continue to grow, universities must find novel ways to prepare students to provide high quality services to this population. This paper describes UNC MSHAC as a unique service-learning opportunity that combines interdisciplinary teamwork, home-based service to medically complex elderly individuals, and a longitudinal experience for students into one programmatic experience. The evaluation findings reported here suggest that UNC MSHAC may improve students' attitudes toward older adults and contribute to improvements in their care of the elderly. The experience is acceptable to students and acts as a platform for universities to serve their local communities. UNC MSHAC may serve as a model for other universities dedicated to developing longitudinal, interdisciplinary, home-based, service-learning experiences for health professional students.



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