

From Theory to Practice:

Testing an Expert System for Diffusing Evidence-based Health Programs

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Executive Summary

The National Council on the Aging (NCOA), the National Institute of Senior Centers (NISC) and the U.S. Administration on Aging (AoA) are collaborating to increase the delivery of evidence-based innovations that increase the health and independence of older adults through senior centers. The 15,000 senior centers in America play an important role in assisting diverse groups of older adults to age in a successful and productive manner. Senior centers serve close to 10 million older adults annually.

Traditional strategies for disseminating innovative ideas and programs (e.g., publications, conferences, training, technical assistance and grants programs) often produce disappointing results and are not sufficiently cost-effective to allow for widespread national diffusion within the constraints of available resources. Organizations often learn about innovative programs by chance, do not understand if there is a fit between the program and their organization, cannot assess if they have the financial and resource base to adopt the program, and have difficulty documenting precisely what they need to implement the program.

For the past two years, NCOA has been working with Everett Rogers, Ph.D. (who recently passed away) to develop processes and web-based tools for facilitating diffusion of innovations. NCOA's Diffusion of Innovations (DOI) Expert System operationalizes the behavioral components of Rogers' diffusion of innovation model (Rogers, 2003). Behavioral and attitudinal characteristics of potential adopter organizations are integrated with their perceptions of the characteristics of the innovation and its "fit" to assess the willingness of the organization to implement the innovation. A detailed checklist measured the organizations' resource capacity and prior experience required for program implementation. A gap analysis, often used by business consultants to measure the

resource gaps in organizations considering adoption of a new program, determined the financial and resource needs of each center. The result is a comprehensive analytical tool for assessing capacity and willingness of organizations to adopt specific innovations.

Study Objectives

In this project, NCOA/NISC collaborated with the leaders of the Senior Wellness Project (a program of Senior Services of Seattle/King County) to develop a customized version of the DOI Expert System to assess the capacity and willingness of senior centers to implement two key evidence-based components of the Senior Wellness Project (SWP): the Health Enhancement Program (HEP) and the Lifetime Fitness Program (LFP). NCOA/NISC then worked with SWP leadership and 199 senior centers to:

- Demonstrate the feasibility of developing and deploying customized versions of the DOI Expert System for the LFP and HEP programs.
- Demonstrate how the DOI Expert System can quantify measures of "capacity" and "willingness" to determine a center's readiness to adopt the proposed programs. This delineates the specific resources that each center needs to adopt the HEP and LFP programs as well as the organization's attitudinal readiness to adopt a new program.
- Demonstrate how to aggregate the output from the DOI Expert System on readiness status and resource needs of individual organizations to evaluate the needs of an entire market segment.
- Demonstrate how the data derived from this approach can offer more precise estimates of funding and technical assistance needed. This enables

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funding sources to make informed decisions when granting awards.

We believe we have succeeded in achieving all of these objectives.

Study Outcomes

The study developed and demonstrated processes and web-based tools by which readiness (including capacity and willingness) was “operationalized” using quantitative measures.

- The measures for the attitudinal components of the diffusion of innovation model were carefully constructed and tested to determine the ability of the measures to determine the relationships between the model components and the innovation.
- The method for collecting the data to calculate the gap between what resources are needed and what centers lack (e.g., they currently do not have nor can they get access to the resource) was based on a careful analysis of the SWP experience and documentation.

The research scientifically validated the quantitative measures’ ability to replicate the relationships among the components of Rogers’ theoretical model.

- Statistical analysis revealed that the empirical solutions corroborated the theoretical specification of the original diffusion model. Factor analysis was conducted separately for LFP and HEP models using all items in each of three domains. The statistical solutions for LFP and HEP were almost identical and showed statistically significant correlations among the related factors. Therefore, summary indices were created for LFP and HEP factors based on Roger’s theoretical constructs and used in the final specification of the statistical models.

The study demonstrated the feasibility of customizing a generic interactive web-based “Diffusion of Innovation (DOI) Expert System” to assess the key elements required to implement the Senior Wellness Project, to understand the status of diffusion of a group of potential adopters, and to develop data-driven diffusion strategies.

- The DOI Expert System enables diffusion agents to understand in considerable detail the capacity, willingness and resource requirements needed for individual centers, groups of centers, or the universe of centers to adopt the Senior Wellness Project.
- The rank ordering of centers based on systematic assessment of capacity and willingness characteristics will help target the most likely-to-implement centers first, thereby minimizing marketing and outreach efforts and maximizing resources.

The research identified 63 centers (31.6%) that currently have the capacity and willingness to implement the Lifetime Fitness Program.

- Ten (n=10) of the 63 centers (5.0% of n=199) that have the capacity and willingness to implement the LFP state that they do not need additional funding for either year one or for ongoing years.
- About one fourth (n=53; 26.6% of the 199 centers) indicate that they would require an average of \$6,207 to implement the program in the first year. This totals \$328,978 to cover the first year of costs for all centers with the capacity and willingness to implement the LFP.
- The 53 centers each need an average of \$3,672 to continue the program each year. This totals \$194,609 per year for ongoing costs among all centers with the capacity and willingness to implement the LFP.

The research identified a total of 26 centers (13.1%) that currently have the capacity and willingness to implement the Health Enhancement Program.

- Two (n=2) of the 26 centers (1.0% of n=199) that have the capacity and willingness to implement the HEP state that they do not need additional funding.
- About one eighth (n=24; 12.1% of n=199) of the centers in the survey indicate they currently have the capacity and willingness to implement the HEP and they would require, on average, \$32,835 to implement the program in the first year. This totals \$788,038 to cover the first year of

costs for all centers with the capacity and willingness to implement the HEP.

- The 24 centers need an estimated \$16,071 to continue the program each year. This totals \$385,698 per year for ongoing costs among all centers with the capacity and willingness to implement the HEP.

SWP's top three benefits for potential senior center adopters were the programs' ability to 1) attract new people; 2) broaden the range of activities offered; and 3) minimally affect staffing and facility use.

- Providing opportunities for partnerships and offering an on-going program that encourages return visits and builds traffic through the center at peak hours were also rated highly. The scientific basis for the programs and a licensing package that includes everything are also very important to the centers considering implementation. In general, the key benefits tested were important, with rating scores in the range of 1.9 to 2.7 on a 7-point scale.

The greatest perceived challenge facing potential adopters of the SWP is securing funding for start-up and for ongoing operations, licensing and annual renewal fees and general support costs.

- Relationship building issues followed—building partnerships to secure funding and in-kind resources and recruiting and retaining bilingual instructors, especially in ethnically diverse states. Marketing issues fell in the middle of the ratings. Coping with a slow start due to low initial participation and the recruitment and retention of new participants were seen as moderate challenges. The remainder of the challenges relate to participant tracking and monitoring inside and outside of the program and recruiting and training staff who are philosophically well-matched with the program.

Research-based Recommendations

The findings of this research, which were reviewed and discussed by a panel of experts, lead to several specific recommendations for how to maximize diffusion of the Senior Wellness Project:

- Begin by targeting those centers that can implement the programs without financial help. The greatest barrier to adoption – lack of financing – is not an issue, so approach them first to encourage early adoption of the programs. This would include 10 centers ready to implement LFP and two centers ready to implement HEP.
- Focus next on those senior centers with high or moderate capacity and willingness. For LFP, 53 senior centers are ready (e.g., they have the capacity and willingness), but they need help securing the financial resources to the program. Twenty-four (24) centers are ready and willing to implement HEP but need assistance to secure needed funding, as well.
- Provide feedback to all senior centers that participated in the survey about their readiness (including capacity and willingness) scores. Avoid devoting significant time or resources, however, to centers that have low capacity and/or low willingness. If a senior center initiates contact with SWP to get more information and are willing to build capacity and attitudinally embrace the innovations, they will be good candidates to reassess using the DOI Expert System.
- Use research findings to revise marketing materials, strategies and approaches by SWP. Emphasizing the most important program benefits will allow SWP to focus on the programs as potential solutions needed by the centers to address their clientele and organizational needs. The perceived challenges can be addressed in marketing materials and discussions with prospective adopters of the program by finding ways to eliminate or mitigate the challenges.
- For future development, design and implement strategies for cost-effectively encouraging potential adopters to begin by using the DOI Expert System to ascertain if they are good candidates to adopt the program and what gaps need to be filled. To the greatest extent possible, concentrate time and resources only on centers that have high or moderate capacity and willingness.

Potential Next Steps

Based on a review of the research findings, a panel of experts identified potential next steps for national diffusion of SWP as well as other evidence-based interventions to foster health and independence of older people. Key recommendations included:

- Develop and implement a national program for the diffusion of the Lifetime Fitness Program (LFP) based on the findings of this project. This would include the following:
 - 1) implementation at 100 sites, with financial support for the first two years;
 - 2) consultation and support for a staged marketing plan for LFP;
 - 3) refinement of the survey instrument into an on-line decision support tool;
 - 4) technical assistance from SSSKC to the sites; and
 - 5) ongoing educational and networking opportunities from NCOA and NISC.
- Develop and implement a national program for the diffusion of the Health Enhancement Program (HEP). This would include the following:
 - 1) implementation at 24 sites, with financial support for the first and ensuing years;
 - 2) consultation and support for a staged marketing plan for HEP;
 - 3) refinement of the survey instrument into an on-line decision support tool;
 - 4) technical assistance from Senior Services of Seattle/King County (SSSKC) to the sites;
 - 5) ongoing educational and networking opportunities from NCOA and NISC; and
 - 6) expert program review and refinement to help modify the program to reduce cost and complexity but retain the essential elements to sustain the benefits of the intervention.
- Evaluate the value of the NCOA Diffusion of Innovation Tool to SSSKC and SWP for increasing adoption of LFP and HEP, assessing the use of the DOI Expert System to:
 - 1) help SSSKC increase diffusion faster at less marketing cost;
 - 2) facilitate understanding and decision-making by potential adopters; and
 - 3) inform the development of analytically driven diffusion strategies for SWP and potentially other evidence-based innovations in senior health.
- Enhance the current DOI Expert System so that it provides automatic on-line feedback to users about their willingness, capacity and gaps. Evaluate the benefits and utility of the DOI Expert System and the feedback it provides for user organizations.
- Seek additional evidence-based programs that are ready for national replication and that might benefit from adoption and use of NCOA's DOI Expert System.



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